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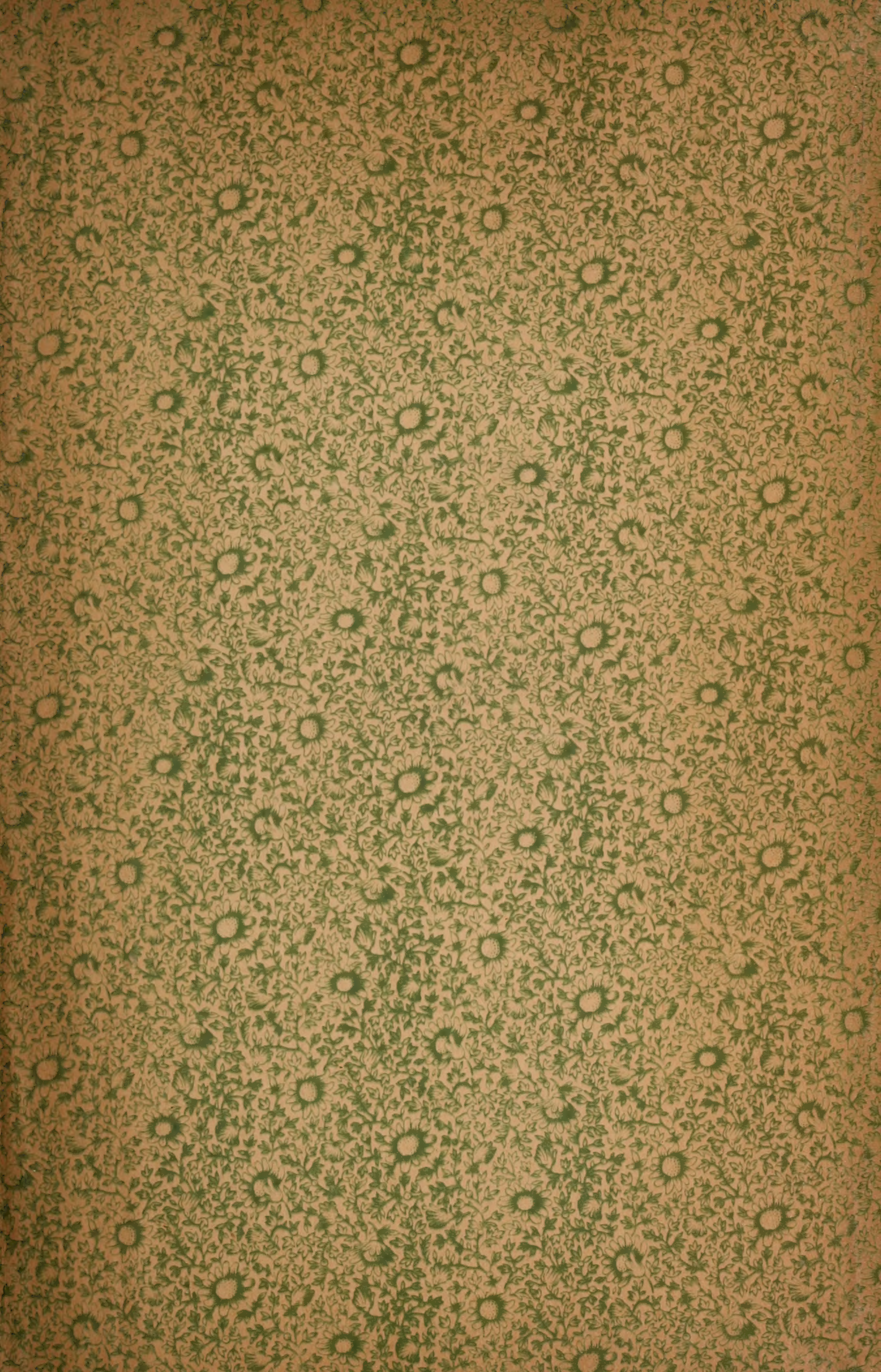

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DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE

C. N. JOHNSON, M. A., L. D. S., D. D. S.
EDITOR

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THE DENTAL PULP AND PERIAPICAL TISSUES: DIAGNOSIS AND PROGNOSIS OF THEIR MORE COMMON PATHOLOGIC CONDITIONS.*

BY WILLIAM H. G. LOGAN, M.D., D.D.S., CHICAGO, ILL.

The purpose of this paper is to create, if possible, a greater interest in the more exact diagnosis of the common pathologic conditions involving primarily the dental pulp, and secondary, the periapical tissues. For, if one always knew the true meaning of each clinical symptom or pathologic finding, or combination of manifestations resulting when the pulp is irritated, the number of dento-alveolar abscesses and the frequency of serious systemic effects resulting from chronic periapical focci could be greatly reduced—provided the operator did his full duty by removing the pulp when the patient presented with the organ in such a pathologic condition that its vitality could not permanently be maintained.

It seems to me it is far wiser to devitalize or anesthetize and remove the pulp while it is yet alive and in a hyperemic or inflammatory state, if such an opportunity presents, than to wait for it to die of its own volition, with the possible and probable accompaniments of either ulceration, abscess formation, or putrescence of the pulp and ultimate involvement of the periapical tissues.

The paper will not, however, contend that all irritated pulps should be removed for fear they might die or that all pulpless teeth should be extracted, but will maintain that all pulps should be removed for fear of subsequent effects, when an intelligent reading of findings presented surely informs us that the pulp will soon die as result of the tissue changes having already occurred in this organ. Perhaps the reading of a brief poem will best show the sentiment and idea behind the essay. The poem is entitled, "The Fence or the Ambulance."

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*Read before the Minnesota State Dental Association, June 12, 1915.

'Twas a dangerous cliff, as they freely confessed,
Tho' to walk near its crest was so pleasant,
But over its terrible edge there has slipped
A duke and full many a peasant.
So the people said something would have to be done.
But their projects did not at all tally;
Some said, put a fence around the edge of the cliff,
Some, an ambulance down in the valley.

But the cry for the ambulance carried the day,
For it spread through the neighboring city;
A fence may be useful or not, it is true,
But each heart was brimful of pity
For those who slipped over that dangerous cliff
And the dwellers in highway and valley
Gave pound and gave pence not to put up a fence,
But an ambulance down in the valley.

For the cliff is alright if you're careful, they said,
And if folks ever slip or are dropping,
It isn't the slipping that hurts them so much
As the shock down below when they're stopping.
Then an old sage remarked, "It's a marvel to me
That people give far more attention
To repairing results than to stopping the cause
When they'd much better aim at prevention.

"Let us stop at its source all this mischief," cried he,
Come, neighbors and friends, let us rally:
If the cliff we will fence we might almost dispense
With the ambulance down in the valley."

"Oh, he's a fanatic," the others rejoined,
Dispense with the ambulance? Never!
He'd dispense with all charities, too, if he could,
No, we will protect them forever.

Aren't we picking folks up just as fast as they fall?
And shall this man dictate to us? Shall he?
Why should people of sense stop to put up a fence
While their ambulance works down in the valley?"

But a sensible few who are practical, too,
Will not bear with such nonsense much longer:
They believe that prevention is better than cure,
And their party will soon be the stronger.
Encourage them, then, with your purse, views and pen
And while other philanthropists dally,
They will scorn all pretense and put up a stout fence
On the cliff that hangs over the valley.

As one reads this poem and considers its relation to dental problems, we recall that for the ten or fifteen years previous to 1910, a great deal of attention was given to the therapeutic equipment essential to the treatment of septic and putrescent conditions of the dental pulp—furthermore our members have been engaged in the last few years in a study of the relation existing between chronic periapical infections and their systemic effects and better methods for filling root canals. Thus, we find the profession as a whole has not been considering sufficiently the intelligent building of a fence about the diseased pulp in the form of a proper diagnosis, which would decrease the number of infective involvements of the dental pulp and periapical tissues.

Now, when we endeavor to differentiate the conditions found in the dental pulp without having a portion of the tissue placed under the microscope following the diagnosis for verification, the conclusions are rightfully open to discussion. Although I have done this work frequently I do not feel my statements can be looked upon as final when I affirm that a pulp, if the seat of such disturbance, will undergo such tissue changes that it will die in a short period even though given therapeutic aid. Conclusive proof of such statements could only be established by first agreeing to the etiology, symptomatology, diagnosis and tissue changes that have been claimed to occur. The next step must be the extraction of the tooth during a period of pain, so as to obtain the pulp in its abnormal state. Then if a specimen under the microscope verifies our diagnosis, we have yet fallen short of our proof that this pulp would have died in a short time under the most favorable conditions. On the other hand, after diagnosing a certain condition of the pulp as a given disease, which under a certain line of treatment would continue to live, if time proves our assertion, the designing critic can yet say the pulp was not involved to the extent claimed or it would have died.

But dropping such hypercritical thoughts, and holding as the late Dr. Louis Jack said: "In the treatment of an organ that cannot be brought under ocular inspection, the chief guides to determining its state are the apparent conditions viewed in connection with the symptomatology of the case under treatment." So, in view of these facts, I will consider my subject today as it pertains to the dental pulp, from a clinical standpoint based upon close observation of many similar cases wherein I was able to have some of these tissues placed under the microscope for verification. Assuming we all agree that every necrotic and infected pulp should be removed, I invite your consideration of the diagnostic clinical findings of the subject under the following sub-heads:

1. The diagnostic findings when the vitality of the dental pulp in a permanent tooth can be saved.
2. The diagnostic findings when the vitality of the dental pulp in a permanent tooth can possibly be saved.
3. The diagnostic findings when the vitality of the dental pulp in a permanent tooth cannot be saved.
4. Is pulp capping advisable?
5. Should a tooth be extracted because its pulp must be removed?

1. The diagnostic findings when the vitality of the dental pulp in a permanent tooth can be saved.

The disease of this organ we shall discuss, when the pulp can be conserved, is acute active hyperemia, and since correct therapeutics depend upon our correct diagnosis, and, holding that a comprehensive knowledge of the pathologic changes that occur in diseased tissue is essential for their diagnosis, I shall include in this paper the etiology, pathology, diagnosis and prognosis of those pulp lesions where the vitality of the pulp can be, or may be, saved.

Acute active hyperemia of the dental pulp.

Etiology.—By active hyperemia of the dental pulp, I mean an irregular dilation of the arteries and capillaries that contain an excessive amount of blood. From the gradual destruction of the protecting wall of enamel and dentin by caries, erosion, accident, or the placing of metal fillings in close proximity to the pulp, we have in each case here established the opportunity for easy irritation of the pulp by thermal changes, which is the most frequent and direct cause of the first periods of pain that occur in active hyperemia, for we find the ideal opportunity for the application of irritants that will cause loss of control of the vasomotor nerve supply to these arteries and capillaries. As further examples of such irritation as may cause this loss of arterial control; the presence of lateral or apical non-septic pericementitis resulting from over-malleting or the wedging of teeth, and the presence of an alveolar abscess about one tooth frequently resulting in collateral hyperemia of the pulp of an adjacent tooth.

Diagnosis of acute active hyperemia of the dental pulp having a favorable prognosis.

Although any factor or combination of these factors may create the disease, it is in the application of heat or cold whereby we have produced the characteristic diagnostic signs. All those characteristic diagnostic symptoms of acute active hyperemia will be found, if caused by heat or cold, in the fact that the pain only occurs when known irritation is applied and is of but a few moments or minutes duration at the most. The paroxysm of pain subsides without treatment, such pain not occurring again until the application of another known irritant. The period of such irritation is usually during the time of eating or drinking cold or hot foods or fluids, or when exposed to cold drafts. The periods and character of pains are as stated, provided the irritants causing the tissue changes be those named.

If these statements in reference to the early symptoms be true, we would not expect acute active hypermia to begin, only in exceptional cases, without the application of a definitely known irritant. So the rule is, a favorable case of acute active hyperemia exists in a pulp when the pain begins with a known irritant, lasting for a few minutes and subsiding without treatment—not starting up again until the application of another known irritant—with absolute freedom from pain in this pulp between paroxysms. In all instances where the pulp is only diseased to this degree we will find at least a thin layer of normal dentin encasing this diseased pulp throughout its entirety.

Prognosis of acute active hyperemia of the dental pulp.

With such a record and no previous history of a series of similar pulp pains in the tooth, if upon examination we find an intervening wall of dentin between the cavity and the pulp that will allow of appropriate cavity preparation and the leaving of a thin wall of normal dentin overlying the pulp, I should always expect, in every case where I did my full duty, this pulp to return to normal when the findings and symptomatology were as outlined, after one or two treatments at the most, and remain so, in so far as being influenced by the diseased condition described—if the tooth received subsequent proper care.

2. *The diagnostic findings when the vitality of the dental pulp in a permanent tooth can possibly be saved.*

When a pulp is involved with passive hyperemia but slightly, or we have the presence of a slight acute partial non-septic pulpitis confined to a small area of the pulp *and the causative factor can be brought under control,* we have a diseased pulp that *can possibly* be saved.

Passive hyperemia with its etiology and pathology.—Passive or venous hyperemia of the dental pulp arises as result of some interference that is sufficient to cause a thickening of the vein-wall or the formation of a thrombus that will obstruct to a degree the return circulation of blood from these tissues through the veins. The frequent occurrence of retardation of the flow of venous blood from the pulp may be due in part to the histologic make-up of this tissue.

Since the pulp veins do not have a normal sheath, the escape of blood elements through the vessel walls easily follows when the damming back of the blood begins in the vein by the obstructing thrombus. This thrombus remaining, the first result will be seen between it and the capillaries, the flow becoming slowed or stopped temporarily, and when total stasis results necrosis of the pulp follows. As a rule, venous hyperemia of this organ only occurs after we have had a history of active hyperemia preceding it.

In active and passive hyperemia, both the tissue pressure and tissue tension are increased. Therefore, although we have an embolus deposited, or a thrombus present that interferes with the out-flow of the blood, we must take recognition of nature's aid accompanying active hyperemia in the increase of tissue pressure that causes a progressive filling of the vein from the constant influx of blood from the arteries through the capillaries into the obstructed vein or veins. If the obstructing thrombus is not quickly overcome by the increased pressure and tension, we find transudation of the fluid and cellular elements of the blood into the very limited tissue spaces of the pulp outside the stream. Where the pathologic involvement has been extensive enough to cause prolonged circulatory disturbances, it is creative of sufficient transudation of plasma and diapedesis of erythrocytes to cause pain to arise of considerable duration, occurring without the application of a known irritant to the tooth and the paroxysms becoming more constant to the point of the patient not being free from disturbance between these periods. When such pain results the pulp is so extensively diseased with passive hyperemia that I do not believe one can save its vitality.

The diagnosis of passive hyperemia and acute partial non-septic pulpitis where the vitality of the pulp *can possibly be saved,* will be considered together for the reason that one is frequently, or mayhap always, unable to differentiate by clinical findings between passive hyperemia and beginning non-septic pulpitis.

Acute partial non-septic pulpitis.—An acute partial non-septic pulpitis is an inflammatory involvement of a small area of the pulp. The portion first undergoing inflammatory changes is, as a rule, the area that first receives the burden of the shock when irritated. For example, if one horn of the pulp is nearly approached by dental caries, that portion is the first to take on characteristic inflammatory tissue changes.

Etiology.—History of a previous acute active and passive hyperemia with or without large fillings present, or carious dentin overlying a small area of the pulp, these giving opportunities for constant application of thermal changes and the irritating effects of the presence of decalcified dentin containing bacteria and their by-products. The *pathology* of acute partial non-septic pulpitis follows the formation of a thrombus in the vein or veins of the pulp, found in passive hyperemia. If inflammation is to follow, certain changes beyond those characteristic of passive hyperemia must take place. The presence of the thrombus retarding or obstructing the outgoing blood, causes an increased pressure on the distal side of the obstruction, with a loss of normal control of the influences that regulate the calibre of the vessels, the veins gradually dilate, increasing the size of their tissue spaces and allowing of the characteristic easy influx of fluid and cellular blood elements into the perivascular tissue devoid of lymphatics. This escaping exudate is always small in amount in inflammations of the pulp because of its bone-like encasement, unless at some point in the pulp chamber there be a considerable exposure of the organ.

Diagnostic symptoms of passive hyperemia or acute non-septic pulpitis that will warrant treatment with the idea in view that this pulp may live.

I am not positive I can accurately answer this question, nor have I found in the writings of others, a satisfactory statement I can use here as a guide; therefore, until more scientific proof has been presented my opinion as to when pulps can be saved stands as here recorded.

Pain intermittent, the paroxysms lasting at the most from five to thirty minutes. Where the pain occurs without known irritation more than once or twice in twenty-four hours, I would not, with rare exceptions, endeavor to save the pulp, providing the time of this return of pain without known irritation is at night. Sensitive to heat and cold, and pain not relieved by application of cold water. Pulp perfectly comfortable between periods. Extreme irritation causing pronounced results with the paroxysms subsiding in five to thirty minutes without treatment. The patient may or may not be able to locate the offending tooth. Tooth not sore under pressure from an apical pericemental involvement that was caused by a disease spreading by continuity from the pulp. This pulp must be covered in its entirety with at least a thin layer of normal dentin.

Before outlining the findings where the effort should not be made to save these pulps, I wish to affirm that the attempt to retain the vitality of a pulp involved with passive hyperemia or partial non-septic pulpitis is apt to prove futile under the most favorable conditions unless the patient enjoys good health and will of his own accord give his teeth exceptional care and have them examined regularly.

3. *The diagnostic findings when the vitality of the pulp in a permanent tooth cannot be saved.*

I would not endeavor to save the vitality of a pulp extensively involved with passive hyperemia, extensive partial non-septic pulpitis, total non-septic pulpitis nor an infected pulp.

Cardinal symptoms and findings accompanying these diseases that contraindicate the effort to save the pulp's vitality when the root ends are fully formed.

A.—All pulps exposed by dental caries should be considered infected, therefore removal in every instance is indicated. B.—When a pulp has been exposed by accident and the tissue injured, for example, by excavator or bur, the vitality of the pulp cannot be permanently maintained. C.—Remove the dental pulp in those cases where carious dentin is found lying in contact with it. D.—When the paroxysms of pain have been of one or two hours duration or have become constant and occur with or without the application of a known irritant and are most pronounced at night, the prognosis of this pulp's vitality is hopeless. E.—When a tooth becomes sore under pressure as result of a periapical inflammation caused by the pulp disease spreading by continuity to the tissues beyond the root end, begin treatment that is to terminate in the filling of the root canal. F.—Every pulp should be removed when the pain is momentarily relieved by the application of cold water.

In the application of the above statement, let it be remembered they only have reference to pulp diseases in teeth that have reached full development.

4. *Is pulp capping advisable?*

Pulp capping with our present technic should be looked upon as a doubtful procedure in all cases after the root end has formed. I believe to cap a pulp that has been exposed by either dental caries or from the removal of carious dentin that was lying in contact with the pulp is to court positive failure. However, many careful operators have successfully capped pulps before the root end had fully formed, that were exposed in the process of cavity preparation by opening through a thin layer of normal dentin. I believe there is an agreement that it is wise in many instances to cap pulps for the purpose of maintaining the pulp's vitality as long as possible, when we wish the benefit of the activity of the odontoblastic cells to complete root end development.

5. *What should be done with pulpless teeth not having incurable chronic infections about their root ends?*

I believe the safe course to pursue is to extract every pulpless tooth in which a proper root canal filling cannot be placed, but I believe with the means now at hand it is possible to properly fill most root canals, if the operator is willing to develop the technic and verify his work by radiograms.

I wish to conclude this paper with a statement that has a bearing upon the general treatment of diseased pulps. These cases can best be handled when nothing is allowed to enter the pulp-chamber which is not sterile, and the protecting field and rubber dam about it is in the same aseptic condition. In treating the root canals of a tooth subjected to occlusal stress, seal the pulp-chamber by placing gutta percha or temporary stopping in the base of the cavity moistening the edges with chloroform. To protect the gutta percha and remedy beneath, flow over this a sufficient amount of treatment cement. This is the only technic I am acquainted with that will to a degree of certainty prevent bacterial contamination of the remedy employed to treat root canals. Let the last treatment in cases of putrescent or septic conditions of the dental pulp be placed not longer than two or three days at the most previous to the filling of the root canals. In the treatment of vital pulps remove all decalcified and softened dentin between the cavity and the diseased pulp, because our remedy will not produce its full therapeutic effects unless placed in contact with solid dentin.

I desire to reaffirm my appreciation of the valuable contributions made on the histology and pathology of the dental pulp by Miller, Burchard, Black, Cook, Hopewell-Smith and Noyes, and to remind you that the dental profession's greatest weakness, as I view it, is not, as has ofttimes been stated, the lack of recorded histo-pathologic dictum, but the profession's greatest weakness is manifested in the unwillingness of the individual member to study sufficiently the printed truths to the end that to err would be the exception when called upon to differentiate the varied pathologic lesions of the oral cavity.

THE BUSINESS SIDE OF DENTISTRY*

BY GUY F. CORLEY, D. D. S., MATTOON, ILL.

The following is intended more especially as an outline of business practices for the man who resides in a small community, where, as its author states, the operator knows most of those who come to him for services; knows and sympathizes with people less fortunate in life. Some of the suggestions made would not be practical for the man who resides in any of the large commercial cities where he cannot possibly have this intimate acquaintance with his patients.

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*Read before the Eastern Illinois Dental Society, October, 1915.

I appear before you for a short discussion of the business side of our profession, not by invitation, but by command of our program committee. This question of business is as old as the profession itself and one that has in the past received too little consideration. In the last few years it has been gone over pretty thoroughly by some of our best men who have tried to arrive at scientific conclusions by real study of the subject, one of our magazines has devoted its pages to the subject for some time almost to the exclusion of other matter. These articles have usually taken up the question of fees, how to make more, and do less. Many times it has seemed to me that the best interests of the patients were treated very lightly or ignored entirely.

Many men have, like myself, recorded their personal observation only. Personal observation should be most beneficial in solving any problem, the difficulty met with in using such observation comes from the fact that most of us are very poor observers. We fail to look at events and circumstances with deliberate judgment. We view matters in the most superficial manner, then immediately offer our opinion and even congratulate ourselves that that opinion is a good one till some one who really thinks questions it; then we very ungracefully back up or stubbornly attempt to defend a position that has absolutely no merit to recommend it. The difficulty is that so few of us are real students, and this lack accounts for many of our shortcomings that will not be mentioned in this paper.

There is a disappointment in store for any of you who may have anticipated that I shall assay the task of telling you how to make two dollars where you formerly made one. If I could I should not hesitate to do so, for after having spent five weeks away from my office this summer the presence of a postage stamp would have made a formidable looking bulge in my own pocket book; and had I any new or advanced ideas of increasing incomes, certainly I should try them out on my own behalf.

This question of the business side of our profession could be separated into many subdivisions but for the purpose of this short paper we will use three. Of course it is taken for granted that the professional education has been thorough, so that little reference is needed to this subject in the present paper.

The three general heads or subdivisions that we will use are: Equipment, Handling of the Patient in the Office, and Collecting.

There are several firms in nearby cities who are making a specialty of office furnishing. I somewhat recently visited one. Their salesmen grew most enthusiastic when discussing the subject of furnishing and equipment. They would in many instances have you think that it is absolutely necessary that your equipment be only of this year's model. I know that there is a lot of sense in much of their argument. There is every reason for having the equipment complete enough that the operation may be performed speedily and with the least exertion to the operator.

I also realize the value of first impressions on the patient when he enters a strange office. If the waiting room is furnished with dignity and taste the patient's attitude toward the possessor of such an office cannot but be different from what it would were his waiting room furnished with odds and ends of the discards from home as I have seen it on many occasions.

Little details sometimes count for much, little things to which one is not likely to give serious consideration. To illustrate: Several years ago when I had just finished the furnishing of an office an elderly friend and patient came in just for "a wish you well visit." He looked things over, tried my chairs, etc. Then he told me that in my furnishing I had overlooked the comfort of the fellow who, like himself, was a victim of rheumatism. My chairs were all too low, so low that he got up and down in them with some difficulty. And I found that he voiced the sentiment of other elderly people. These things are of minor importance and only mentioned to prove the former statement that small details should receive thoughtful consideration

In my office I have a rear or blind waiting room; this I have from necessity and not from choice. I do not believe that I should wait patiently for any length of time in a rear room and I do not congratulate myself that my patients do. Consequently I should advise any operator who can choose just what he may want, to have a bright, cheery waiting room.

Sometimes making a stranger comfortable in the waiting room may mean a new patient and an opportunity to make acquaintances in a new community; while not making the same stranger comfortable enough to patiently wait till you can see him may mean that you suffer an equal loss. Before leaving this waiting room subject I want to add that it is just as essential that the furnishing should be kept clean, last month's magazines kept out, etc., as it is that you should have good furnishings.

Supposing that our patient, though, has now passed into the operating room and been seated ready for examination. Experience has taught me that it is best to hear the patient's story through, and even get his ideas of what he thinks ought to be done. These ideas may not be at all practical but the time spent in listening to them at least gives you an opportunity to study the prospect. You find out from the ideas he has advanced if they are his own or those of some other practitioner whom he has just left in order to see you and find out for himself if Dr. Smith is not a robber.

It is, to me, a little difficult to ask a patient if he can afford to have something out of the ordinary done and many times a little conversation at this time may give you an idea of what he is capable of having done; referring directly to his ability to meet financial obligations. Some of you may be clever enough to determine such matters by observation but I can not do so. I try not to sidestep in any particular the question of expense with a new patient. It is a real embarrassment to me to have completed a piece of work for a patient, then because I had neglected to have an understanding relative to the fee have the patient conscientiously think he has been taken advantage of. This is not intended to defend the fellow that is purposely looking for an opportunity to object to any reasonable fee.

As we go over the work together, if he questions fees or methods that I suggest, even if he intimates that my fees are higher or lower than some fellow practitioner I try not to lose interest. Of course it is then evident that he has been shopping but suppose he has? Do not you and I do a little before we squander thirty dollars for a new overcoat or before we spend a like amount for anything else that may not be standard in price? It is perfectly natural that one who comes to you a stranger and has fees quoted to him that seem unreasonable should question them in his own mind, and it is only an expression of frankness if he suggests the idea that he has in his mind to you. Should we not come down from the rather artificial position that we assumed and frankly discuss expenditures with patients if they intimate a desire to do so?

If I am going over work for a patient of whose ability to meet any financial obligation I am not sure, and he questions fees I try to explain the why in detail. I try to steer as far from an attitude of contempt of his questions as possible. If there is any one thing that tries my temper it is for a salesman to show me less courtesy after I have suggested to him that I do not feel I can or want to afford something as expensive as he is showing me, in other words I like to be premitted to use my own judgment as to what I can and will afford. But some in our profession argue that the prospective patient is not capable of judging values. In a measure that is true and in an equal measure it is true of you and of me in the purchase of anything except the most standard article. And to assume an air of haughty indifference to the patient's question of why you should be charging ten dollars for what he has been told Dr. Jones asks but five is certainly lacking in courtesy; or to say in that superior manner which some like to assume, "Well, if that is the kind that you wish why do you not go there and get it, then?" seems to me not only lacking in courtesy but in good business policy. I realize full well that a chronic shopper is a great annoyance in a busy day but at the same time I do not criticise any one for wanting to know where and for what purpose his money is being spent.

Some operators are taking the position that they will put the mouth in an "efficient condition." If I understand their proposition right it is this, after having made a very thorough examination of the mouth they determine what is necessary in the way of work that the patient may have the most possible service from their teeth, then a proposition is made to the patient to do all of the work or none of it. This would be a most satisfactory way to handle cases if all patients were so situated and financially able to have anything they wanted. Unfortunately, while poverty is no disgrace it is at times a great inconvenience, and because I cannot afford the purchase of both suit and overcoat it seems to me no argument for my going without the one that I can purchase.

Again I do recognize the fact that poor patients make expenditures in other lines in proportion to their desire of possession. How many of us have in the last few years been amazed to see some family, whom we thought neither could nor would, loosen up and buy a next year's model.

Or as another example, the young woman working as a domestic many times blossom out in a new spring or fall equipment that rivals that of the mistress who employs her. Now in many instances she has purchased that at some sacrifice because to her mind it is of more importance than something else.

If a dental operator is sufficiently clever in presenting to a patient the advantages of an efficient dental organism he may many times get an individual to have work done even though it may mean a curtailment of expense somewhere else.

To attract permanently satisfied patients, the kind one expects to retain from year to year, one must not only be able to talk them into making an expenditure but also intelligently convince them of your personal interest in the case. The element of sincerity and of personal interest on the part of an operator is one that none of us can afford to overlook. The personal interest of the operator is what the patient came for and has a right to demand; and a failure to meet such demand will automatically send the patient to another who will give it.

In my own practice, which I think will compare with that of most of you, I have many patients who, from necessity, must make a dollar go as far as possible. It is foolish on my part to try to induce them to have any expensive work done; to do so would only prove an embarrassment for us both. With patients whose financial condition I know to be such that they cannot afford expensive work I try to substitute something that will give them service and yet be less expensive. Amalgam in many places can be made to take the place of inlays and crowns, and I hasten to add in many instances the patient is far better served with amalgam than with some of our most perfect crown work, even though the charge were the same for both. And here if time permitted I should have discussed the making of higher type of amalgam fillings and in that connection the making of a fee in keeping with the value of the work done and service rendered. But that would be foreign to the real subject of this paper.

We will now suppose that the work for this patient has been determined and done in the most expeditious manner possible. The next step is to collect. Some of you may be able to run on a strictly cash basis but I find it impractical to do so. A cash basis would be the ideal way to conduct all business and I have only words of congratulation for the man who finds it possible to run his practice that way.

Where I know the patient's reputation for payment is good but slow I am perfectly frank in saying to you that I make a fee that justifies my carrying that account a reasonable length of time. I have my assistant go over my books at frequent intervals making a record of the amount due on every open account, and what the date of the last work or payment was.

I then go over the list and from it pick out such as I wish to send statements to. I have never started at A and gone to Z without a break. There may be some specific reason why I think it unwise to send a certain statement at this time and I take the privilege of determining that for myself.

When I send a statement I have a book in which I list that fact, making at the same time, a note as to whether it is the first statement I have sent that patient since a payment was made. If it is, I usually accompany the statement with a polite little request of some sort. I think that it is impossible to be overtactful in the handling of delinquent accounts. To get what is really due you and at the same time keep the good will of the patient is most difficult, but if you succeed I think it pays. I have never yet brought suit though I have collected a few accounts with the assistance of an attorney. I do not think the notoriety that one gets from the newspaper accounts of such suits a very desirable asset. I have no criticism for the operator who is willing to back up his charge with a court demand for payment but when the newspapers get those things they are many times so distorted that the real facts are overshadowed by some supposedly humorous comment of the man who reports the case for his paper, and I repeat that I think it very undesirable notoriety.

In bringing this paper to a close I want to say that I am very conscious of its shortcomings. I have attempted a subject of which many of you were capable of giving far greater consideration than I have been able to do. My hope is that the paper itself will bring some of this out in the discussion. Please handle both paper and subject without gloves.

ROOT CANAL PREPARATION.*

BY J. R. CALLAHAN, D. D. S., CINCINNATI, OHIO.

It is certain that much may be judicially argued in favor of drill or of chemical and mechanical treatment for root preparation and there is something to be said against each agent or combination of agents, and that is what on the present occasion I have to say.

To state one argument is not necessarily to be deaf to all others, and that a man has written a book of travels in Russia is no reason why he should never have been to Africa.

But a comparatively short time ago, before the invention of matches, in the days of our forefathers, neighbor would go to neighbor asking, "Lend us fire." I have traveled hundreds of miles to ask of you, our neighbor, lend us fire, to relight and keep our torches burning, to give us courage, to give us patience and endurance and wisdom to the end that we, who are giving the best that is in us to this yet unsolved problem may be able to report progress in answer to the eager and earnest inquiries of our confreres throughout the world.

Whether it be a tooth from which a devitalized pulp is to be removed after arsenical application or pressure anesthesia, or the opening and cleansing of a pulp canal that shows a moist or dry gangrenous tissue or any or none of the numerous pathological pulp conditions or condition beyond the root end, the goal, the strategic point, is the apical foramen or foramina—foramina in 90 per cent of adult teeth.

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*Read before the Chicago Dental Society, Oct. 19, 1915.

It is then the duty of the operator to obtain a sterile and as direct and as free a passage to the strategic point as the nature of the root canal will permit. It does not meet the present day requirements to say as do some of our text books and essayists —"open the root canals to the end." Our inquiry is, how is this seemingly simple little thing to be done?

To undertake the opening and preparation of a root canal should indicate that the dentist recognizes the necessity for removing every atom of devitalized tissue, having the canal throughout its entire length and in all of its ramifications, including the dentinal tubuli sterile and in such shape and condition that the canals, the tubuli, the formina may be permanently sealed or filled.

Diagnosis, filling of canals or treatment of conditions around and about the root, are not to be discussed farther than may be necessary to make clear the reasons for certain steps to be mentioned.

The dentist should on every possible occasion avail himself of the advantage to be obtained through having one or several radiograms before him for comparison or study. We cannot be reasonably sure of the effectiveness of our efforts without such assistance, nor can we be absolutely certain with them. Many of the pictures thrown on the screens and printed in our journals as evidence of perfect technic and results, are about as clear as rabbit tracks in the snow on a windy day, when it is a difficult matter to determine whether brother rabbit is going or coming, the strategic point being conspicuously absent. Improved apparatus and technic will some day overcome these shortcomings. Inasmuch as the largest number of dentists are for one reason or another deprived of the valuable assistance of the x-ray, and our literature being surcharged with most accurate information in this line, let us then on the present occasion keep in mind the great majority who get along the best way possible without this expensive adjunct.

All operations upon the root canal from beginning to completion are purely surgical and should be conducted upon surgical principles; this being true, the maintenance of aseptic conditions are of first importance.

Superheated steam is the only acceptable method for the sterilization of instruments, cotton, paper points, gutta percha points, etc. Steam chests that are best adapted to this use are known as the Pentz system, made by the Santiseptic Manufacturing Co., Tompkinsville, N. J., and a double chambered steam chest made by the Wilmot Castle Co., of Rochester, N. Y.

The opening of the pulp chamber should be accomplished with as little disturbance of the devitalized pulp tissue as may be possible; to this end it will be well to cut through the dentin with a drill, then use carborundum disks and stones, keeping the carborundum powder wet. This enables the stone to cut rapidly without heating the tooth.

Better results will be obtained if, while using the stones and carborundum powder, all of the tooth crown be removed that interferes with pulp chamber enlargements that may be necessary in getting direct access to the end of the root.

Sufficient enamel and dentin having been removed to give a clear view of the pulp chamber, it will be well to prepare for the placing of the rubber dam, by means of threads, fine polishing strips, separators or by whatever means necessary to insure the dam going to place with little or no forcing. There should be no leakage whatever about any of the teeth included in the field of operation.

If the cavity margin reaches to or below the gum line then a copper band should be fitted and cemented to place about that tooth, so that the dam and clamp can be placed upon or over the band and tooth without danger of displacing the band. The fitting and placing of the band will be described with the illustrations that follow this paper.

The dam being in place bathe the exposed teeth, rubber dam and clamp, etc., with a 70 per cent alcohol. This strength of alcohol is a more effective germicide than the 95 per cent generally used. With warm air dry the cavity; with small fissure drill make a circular cut, leaving a cap of dentin over the pulp chamber which may be removed by a blast of air or a fine excavator. Having exposed the pulp it will in many cases be well to toughen or harden the tissue by placing a drop of alcohol and formolin (about 5 per cent formolin) on the devitalized pulp for a few minutes. Then with hot air dry the pulp, when a fine broach passed along side the pulp or largest branch of the pulp, slightly turning or rotating the broach and withdrawing the broach, will in many cases bring the entire mass including the smaller branches of molar pulps.

Every possible effort should be made to get the entire pulp the first trial. The extracted pulp should be spread on white paper and examined with a magnifying glass that the operator may know the location of pulp fragments if there are any.

The three methods of procedure, from this point, that we wish to discuss briefly are: The drill, the Sodium Potassium, and the Sulfuric acid and Soda Bicarbonate.

The open chamber and canals should first be washed out with normal saline solution, dried, then place shred of cotton saturated with clove oil well within the large canal to remain while we go in search of the very minute canals that may be so small that it is a difficult matter to find them.

Paint the floor of the pulp chamber with tincture of iodin. When the surplus iodin is absorbed by a cotton pellet little dark spots will in most cases reveal the location of the canals. The finest Kerr drill manipulated by hand without pressure, will enter a very fine canal by gently rotating the drill, and being very delicate and flexible and threaded like a screw, will in most cases bring away the remaining pulp tissue, when the canal may be enlarged by gradually increasing the size of drills or the drills may be worked in and out of the canals as files.

These flexible drills will go around a slight curve if the canal is large enough to give the instrument free play. If the instrument binds, at or near the curvature a false pocket will be made on the outer wall of the canal at the curve. This little pocket or pit in the dentin, at the point indicated, prevents further instrumentation within that canal.

Each and every root canal is more or less of a law unto itself. A correct radiogram is of inestimable value. In the absence of the x-ray picture, the operator will be greatly assisted by making a pencil sketch of the probable shape of the tooth. In this way his memory will be refreshed and he be made more keen and alert as to the probable difficulties ahead.

In some cases it may be of advantage to sink a shaft in the root using a bud drill, following the fine canal from a third to a half the length of the root, and from this point with the fine flexible drill. By being patient and careful many of the finer canals may be opened to the foramen.

It is possible, however, that septic matter or pulp fragments that may become septic, have been forced through the foramen into the apical space.

It is not possible that the multiple foramina, or the collateral canals, or the connecting canals or the flat thin cancellous spaces between the main canals in double roots have in any sense been opened or cleansed.

The drills in many such roots have simply drilled holes through organic substance in various stages of disintegration. such substances cannot be washed or swabbed out but are left within the canal, sometimes saturated with such antiseptic medicaments as may be applied, and finally incorporated with the root canal filling.

Schreier's Kalium-Natrium or Sodium Potassium, as we more frequently name it, is a concentrated alkali caustic, explosive when in contact with water, yet a most useful agent when carefully and skillfully handled, for the purpose of removing organic substance from root canals. It is also a useful adjunct for opening and enlarging root canals after the manner advocated by Drs. Rhein and Ottolengui.

If the dentist will moisten a spot of skin on the back of his own hand and place thereon a small particle of sodium potassium he will realize at once the necessity of giving close attention to the protection of the patient, including the nostrils which should be protected in some way.

All the pulp tissue that is within reach of the broaches having been removed, small particles of the sodium potassium, size of a pinhead, placed where the very fine canals should be, the dentin being moist, will by dissolving the organic substance, reveal the elusive anterion canals of lower molars or buccal canals of upper molars. These canals after being located and having been exposed to the action of the sodium potassium for a few minutes, should be attacked with what has been named picks. Dr. Rhein having devised a very efficient instrument under this name. An instrument will be illustrated later that has the advantage of being more rigid and also having interchangeable points.

These picks with assistance of the sodium potassium which breaks down the organic matrix of the dentin converting it into a soapy like mass, which acts as a lubricant, will work their way into the canal enlarging and sterilizing in a most satisfactory manner.

After advancing a distance into the canal if the pick begins to bind or lock, thereby becoming a piston within the canal a large Gates-Glidden drill from which the point has been ground may be used to enlarge the lumen of the canal so the pick may work more freely.

When having reached the region of a curve in the canal or a near approach to the foramen, it will be safer to use a finer instrument, a Donaldson broach from which the barbs have been partially removerd, for the purpose of negotiating the curve if possible, also to eliminate as much as possible the piston effect of the larger instrument that might force the caustic contents of the canal into the region beyond the foramen, and do damage that will be difficult to control.

I have had two severe burns in my practice from this cause. In one case the tooth had to be extracted and the second one I fear will be lost.

Chemical substances which cause death and degeneration of tissues are called caustics. Alkalies, such as sodium potassium and calcium; acids, such as hydrochloric, sulfuric, nitric, arsenious and carbolic, and the salts of some metals, such as silver nitrate, zinc chlorid, copper sulphate, are the most common types of caustics.

The alkalies and metallic salts act by uniting with the albumins, acting as albumin solvents.

"The caustic alkalies are not self limiting; they penetrate deeply into the tissues and destroy the albumin of the mucous surfaces, the horny tissues and the external skin."

Necrosis, followed by eschar formation is caused by strong caustics, the necrosis involving tissues at various depths, depending upon the strength of the caustic, the nature or mode of its action, and the time it is allowed to act.

"Those agents are best suited for cauterization which, like concentrated sulfuric and fuming nitric acid and silver nitrate, penetrate to the deeper layers of the skin and mucous membrane only after acting for some time."

The treatment of chemical injuries, of *recent cases* should be directed toward neutralization of the agent before it penetrates deeply.

Chemists and apothecaries usually have two solutions ready. Acetic acid or vinegar is used to neutralize the alkalies, while a solution of sodium bicarbonate is used to neutralize the acids.

If for any reason it is suspected that sodium potassium has passed beyond the foramen a sulfuric acid solution should be applied quickly followed by soda bicarbonate solution.

I have no doubt that through some of the large foramina at least, the caustic alkali has wrought harm.

In the constricted canals and in the constricted apical region the use of sodium potassium is frequently indicated. The dangerous qualities of a valuable agent should not cause us to overlook its useful qualities. Twenty years ago sulfuric acid solution and soda bircarbonate solution came into use.

The sulfuric acid is used for the purpose of softening the surface of the pulp canal walls to permit the pasage of the barbed or roughened broaches to and fro through the canal, enlarging the canal by breaking loose the softened dentin. Soda bicarbonate solution is thereupon injected into the canal that the broken down dentin and other disorganized substances may be removed from the canal by effervescence caused by the escape of carbonic acid gas that is the product of the neutralizing action of the soda bicarbonate upon the sulfuric acid.

This reaction leaves the canal in a state of sugical cleanliness. This cannot, to my knowledge, be said of any other method or agent.

Twenty years is a long time for a method or theory to stand practically unaltered. Notwithstanding the age of the so-called sulfuric acid treatment (which had much better have been entitled "Sulfuric acid and soda bicarbonate treatment") a brief résumé of the theory and practice of the doctrine may not be amiss.

Concentrated sulfuric acid is also an active escharotic. The acid caustics act by burning the structure with which they come in contact, and not only disintegrate albumen but attack many other organic substances. The breaking up of inorganic and the carbonization of organic substances is to be borne in mind.

Diluted and mild caustics when applied cause an inflammatory action, depending upon the strength and time of application.

A fifty per cent (by volume) solution of sulfuric acid will soften cotton on the carrying instrument. A weak acid solution gives a correspondingly weak reaction in the presence of the soda solution.

The strength of the acid solution should be not less than 20 per cent and not above 40 per cent for root canal work. In my own practice 30 per cent aqueous solution or commercial sulfuric acid by volume is the standard.

Soda bicarbonate should be a saturated solution.

In relation to the action of the acid solution on bone tissue, Mr. George Pollock, F. R. C. S., surgeon to St. George's Hospital, says: "Dilute sulfuric acid does not affect the living, acting chemically on diseased bone alone." Giving the following experiments. "Portions of dead diseased and healthy bone were selected and subjected to the action of sulfuric acid," viz.:

No. 1. Dead bone, 10 grains.
No. 2. Diseased bone, 10 grains.
No. 3. Healthy Bone (middle age), 10 grains.
No. 4. Healthy bone (old age), 10 grains.

Exposed to the action of a mixture of sulfuric acid and water one part in four, for three days, at a temperature of 100 degrees, the following were the results:

No. 1. Dead bone, phosphate of lime, 2 grs. Carbonate of lime, 3.3 grs. dissolved in the mixture.

No. 2. Diseased bone, phosphate of lime 2 grs.. Carbonate of lime 1.3 grs. dissolved in the mixture.

Nos. 3 and 4. In both specimens of healthy bone no action took place.

Dr. Garretson in the treatment of carries of the maxilla recommends the use of the official ordinary sulfuric acid.

On the diseased or partially disorganized soft tissues the solution will have a corrosive and astringent effect or in other words, will break down or destroy the diseased tissue, leaving a fresh clear field for nature with the assistance of mild antispetic treatment to take care of herself.

Why does not sulfuric acid attack and destroy devitalized dentin? The acid at first attacks the tooth substance, breaking down the lime salts, at the same time corroding or carbonizing the organic substance, forming a new compound, thereby establishing a barrier to the further progress of the acid.

Prof. Cassidy (see Dental Chemistry and Materia Medica), says, "The acid attacks the earthy portion forming insoluble calcium sulphate (Ca So4) and at the same time dehydrating the animal or gelatinous portion, which is mainly made up of carbon, hydrogen and oxygen. These two latter elements are withdrawn as already alluded to, leaving the indestructible carbon as a residue to be incorporated with the insoluble sulphate, producing thus, a protecting covering to the unaffected parts beneath, against further inroads of the causing agents."

This protecting covering of carbon and calcium carbonate, are removed or scraped away by each excursion of the rough broach, permitting the acid to take another bite at the dentin. The same chemical and mechanical action repeats itself so long as the broach is kept in motion in the presence of the acid solution.

The depth to which the acid affects the dentin is unfortunately immeasurably small. It would be a great advantage to the work in hand if the acid would or could be made to penetrate further into the dentin. The reason why a larger area of the dentin is not at once affected has already been mentioned. It may be well to recall, however, that dentin consists of an organic matrix, a reticular tissue of fine fibrils richly impregnated with salts of calcium. Traversing the matrix are long fine canals or tubes, the dentinal tubules, twenty-five to thirty thousand to the square millimeter. Immediately surrounding the tubules the matrix is especially dense, forming a lining or sheath to the tubes, known as the dentinal sheaths or Neuman's sheaths. Neuman's sheaths are insoluble in boiling sulfuric acid.

Sulfuric acid causes delicate steel instruments to become brittle and to break on small provocation, leaving small pieces of steel buried within the canal. This unpleasant accident is as a rule due to the manner of manipulating the broach.

For very fine canals the barbs should be partially or wholly removed from the broach, or a fine broach can be made from gauge 20 to 25 piano wire. These broaches should be cut to proper lengths and placed in a rigid holder or handle that will hold the broach in a direct line with the line of force. Either pressure or traction that may be applied to the delicate steel point. For the heavier work, digging or enlarging should be done with larger and stronger points, made of roughened steel. A better and safer instrument may be made by taking the largest tantalum silicate plugger points, Nos. 104 or 105 S. S. W., bend to straight line, remove from the handle, file or grind to proper shape, placed in the strong right angle broach holder made by Ivory. This makes a most effective root canal excavator.

The metal is not acted upon or altered in any way by acids. This manner of enlarging or excavating the canal to a large extent at least eliminates the probability of making a false track or pocket within the canal and does away with the necessity of using a drill at least until the canal is large enough to make drilling a safe procedure.

The point that I am trying to develop is that I believe that the best results are to be obtained by eliminating the undesirable or dangerous, and taking advantage of the safer and desirable features and results that may be obtained through the use or application of every chemical agent or instrument that will meet the exigencies of the case in hand.

In straight and sufficiently open canals or in canals that have been enlarged by chemical means, to a sufficient size to pilot the root drill, for the sake of speed, for convenience in shaping of canal, a Kerr drill, a Gates-Glidden from which the point has been ground, or bud drill, may be used.

If the finer canals contain fairly well organized pulp tissue that the broach fails to engage sodium potassium should be applied after the pulp or other organic tissue has been converted into a soapy substance the removal of this soap from the canal becomes a necessity, some of it may be removed with a stream of water, only a small proportion, however. Swabbing with cotton on a broach does but little better. If the root canals of an extracted tooth be opened and thoroughly treated with sodium potassium the canals then washed out with water as would be done if the tooth were in the mouth, then the tooth dried and the roots cracked open, in the apical third of the root canal a dark, rather dense, soapy mass will be found packed within the fine canal. If the tooth fragments be kept dry for a day or so the dentin will show a greenish yellow color —not a very pronounced discoloration, but sufficient to show the presence of a coloring matter. All of this soapy mass will be thoroughly removed from the canal if sulfuric acid be pumped into the canal in sufficient quantities to overcome the alkali, and having been worked to the end of the canal with broach, then the root canal flooded with a saturated solution of soda bicarbonate. The reaction will at once remove practically all foreign substance from the canal. If the tooth then be dried and the roots cracked open the canals will show white and clean as marble.

With the tantalum root excavator and sulfuric acid the root canal may be enlarged more rapidly and with greater freedom from unpleasant and sometimes dangerous conditions. The acid destroys and breaks down disorganized organic tissue. The soda solution removes the debris without forcing the disorganized substance through an open foramen, as many dentists seem to fear.

If acid solution be placed in a small glass tube, then pour the soda solution in the tube, and it will be seen that chemical action is all on top of the acid, or only on the surface of acid exposed to the soda, or in other words, it does not react in the form of an explosion, the larger end of the canal being open and offering no resistance to the gas. If the acid solution should pass through the foremen no further reaction could take place than that of irritation, as will be shown on the screen.

WHY SOME FILLINGS FAIL.*

BY R. ROGERS, D. D. S., SCALES MOUND, ILL.

In presenting this paper I do not expect to advance any new theory or method of work, but permit me to name some reasons why some fillings fail, and in doing so I may emphasize what has been said by others. I shall not deal with any particular kind of filling material, because I think in the hands of an expert they all have their places in the field of dentistry. I am not in accord with that young man who told me at the Chicago clinic that he uses the gold inlay almost universally. My experience leads me to think each has its place and the operator must exercise his judgment when and where each can best be employed. Then, too, the dentist must understand his ability and know what operation he can best perform in the particular case at hand. In view of the fact that so many new filling materials and devices have been projected in recent years many dentists have abandoned the work they had learned to do with some degree of satisfaction for the new discovery which they have seen demonstrated by a skilled operator, with the result that they do not gain proficiency in either the new or the old.

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*Read before the Illinois State Dental Society, May, 1915.

Incidentally, I may say here that some of the failures may be traced to the careless operator who is thinking more of the cash rather than giving value received for his work. We live in an age when ability must receive its reward, and if the quality of the work demands a better compensation, then we shall certainly receive it. We can learn a lesson from that father in giving advice to his son when he said: "In your work give more than value received, though the employer for whom you work may not compensate you, others seeing the quality of your labor will commend it and your reward is certain."

But I want to call your attention primarily to two particular kinds or classes of work which I may designate as the stay in filling and the conservation filling. The first class is done by men whose sole aim is to make the filling stick without any thought of the shape of the tooth or the work it may be called upon to do.

We have learned that a decayed tooth which is not restored in such a way when filled as to preserve the contact point permits particles of food to wedge between the teeth, causing the patient much trouble, pain and annoyance. It has been said that the chief factor to be observed in proximal fillings is to restore a normal contact. When food is constantly forced down between the teeth by the occluding members a great harm is done to the gum tissue in the interproximal space, but the damage does not end with this, it continues with disastrous results to the hard tissues as well.

Men who do this kind of work do not seem to realize that by wounding the gum in the interproximal space it ends in inflammation, recession of the soft parts, and finally a loose tooth, with the inevitable result. As the time intervening between the different stages has been somewhat remote, the loss of the member has not been attributed to this cause but supposed to be from some other lesion.

Many fillings in proximal cavities are spoiled or ruined in polishing them. Adequate space may have been obtained and the contour of the tooth restored, but the polishing in many instances has been done with sandpaper disks, leaving a flat surface where the contact point should be, and not only this, but in some cases the tooth structure has been ground away to make a smooth surface where there was not sufficient filling used.

Teeth that are filled merely to save or preserrve them often end in failure. I mean by this that a tooth which is not restored in such a way that it will properly occlude with its antagonizing members fails in its purpose as a masticatory organ. If the teeth are to perform their function all the cusps, grooves, inclined planes, etc., of filled teeth must be preserved, permitting the teeth to interlock with the opposing teeth and at the same time hold them in right relation with each other and thus maintain the contact of all the teeth and preserve a healthy tissue in the interproximal space as well as prevent the secondary decay at proximal fillings, which is spoken of by Dr. A. D. Black.

Some one has said the chief aim in filling teeth is to prevent decay. With this statement I must take exception. I contend that carious teeth should have the lost parts restored so that the decay will be arrested and at the same time the usefulness of the organ restored, making the member as nearly normal as skill will permit. The dentist should not be satisfied to simply stop the decay, but he should be an artist able to build up or carve out the parts which are lost.

That he may do this successfully it is necessary to make a thorough study of the shape of the tooth and note carefully the occlusion of the same before the work of filling is commenced. When the occlusion is correct the filling is not easily unseated if the retention and base have been shaped to resist the stress.

What I have in mind has been so much better said by Dr. Ottolengui in a paper which was read before the American Dental Society of Europe in July, 1914, that I have copied from his article: "We have so long believed that the ultimate aim of dentistry is to preserve the teeth that it is with considerable difficulty that this idea can be dethroned. Yet with the knowledge we now have of the relation of proper mastication to the bodily health, the advanced dentist must appreciate that the highest aim of dentistry in the future will not be to save teeth, but rather to save or restore health by saving or restoring teeth.

"It can be easily demonstrated that a tooth may be filled and saved, and yet not be restored to anything even resembling normal form. A tooth may be filled and saved with a filling so poor in form that the patient will actually avoid that side of the jaw when attempting mastication. A tooth may be filled and saved, in many instances for a long term of years, without restoring the particular tooth to such shape that it may resume the functions as a masticatory unit, but, on the contrary, in such manner that it may become a menace to its approximating and antagonizing neighbors."

The second class or kind, which I have designated the "Conservation Filling," is done by men who cut away as little of the tooth structure as possible, often leaving some decayed matter in the cavity. It may seem absurd to some of you or a waste of time to dwell upon this phase of dentistry, but notwithstanding the fact that the teaching of Dr. G. V. Black has been iterated and reiterated in college and society, many dentists continue to fill the proximal cavities without extending the margins beyond the angles of the tooth or into immune territory. It is not an uncommon circumstance to find fillings in the anterior teeth which have been put in from the labial without cutting through to the lingual which have been inserted by men who have been well taught, but continue this poor work. That the extension of the margins of the cavity beyond the susceptible area surrounding that part of the tooth where decay has already started prevents recurrent decay, they are willing to admit.

Dr. Clack, of Mason City, Iowa, in a paper read before the Wisconsin State Society, speaks of a dentist who expected a filling in the distal surface of a bicuspid to prevent a cavity from forming in the mesial surface of the same tooth. It is evident that there are men practicing dentistry who do not understand extension for prevention.

We are told in an article written by Dr. George B. Harris and published in the *American Dental Journal* in December, 1910, that 95 per cent of the amalgam fillings are failures, and the reason he attributes not to the filling material but to a failure of the operator in not properly shaping the cavity and thoroughly removing the decalcified dentin. He also gives as the reason for incomplete excavation the desire of the dentist to avoid pain for the patient. The decayed matter is left in the cavity of a filled tooth by the operator from carelessness, or in some cases the cavity being wet it is not observed. Decay cannot be removed from a cavity where there is not sufficient room. Most of the amalgam fillings are made without any attempt to shape the cavity. It is just as important to have the cavity prepared for amalgam as gold and this can only be done by thoroughly breaking down the overhanging enamel to get free access to all parts of the cavity. Neither can the preparation be made without adjusting the rubber dam which not only permits the operator to get at his work better, but admits more light and allows him to see that all the decay has been removed. To conserve the tooth by not removing the decayed matter or by making grooves, pits, etc., for retention instead of cutting a step in the occlusal surface is doing an injustice to the patients and certainly is not a credit to the dentist.

In conclusion let me say our duty to the patients demands our best services in the preservation of the teeth, and this can only be rendered when we have an interest in their welfare. We should believe in our work and have faith in our ability and show that we are in earnest in our undertaking. Our patients will have no use for half-hearted workmanship, and in this age of universal competition this is truer than ever before. The dentists who secure the best compensation are those who throw all the energies of their being into the work at hand. To do this there must be faith in self and faith in the operation to be performed.

"Only so far as a man believes strongly, mightily," said Frederick Robinson, "can he act cheerfully, or do anything that is worth the doing."

EXTRACTION OF TEETH AS A SURGICAL OPERATION.*

BY E. L. TESKEY, D. D. S. SHABONNA, ILL.

The first operation in dentistry was performed when primitive man was attacked by a severe pain in the jaw, and laying his head on a stone or fallen tree, his companion took a piece of hard wood, a bone, or sharp stone for a punch, and another for a mallet, and with much force and no gentle hand proceeded to knock out a tooth. In this simple manner dental surgery was born, and from that time to this it has been the practice to belittle this operation. In later ages the blacksmiths, barbers, and traveling fakirs extracted teeth, using all sorts of instruments from the crude punch to the more cruel turn-key.

Literature abounds in caustic and ironical references to the pulling of teeth, till by common consent the people and the profession have come to regard it as something which is unimportant, unpleasant, but a necessary evil. The sooner over, the sooner mended.

The dentists are largely to blame for this state of public indifference; all sorts of schemes are resorted to; many dentists extracting the teeth for nothing, in order to secure the making of the plate, and in every way belittling the operation; even the city practitioner refers them to the specialist, not for his skill, but to remove the unpleasant task from his office.

Now let us look briefly at the conditions surrounding this operation; we have a bony tissue imbedded in one of the hardest bones of the body, extending through the mucous membrane and situated in the most exposed area for infection in the body. When removed it leaves a wound which cannot be protected and is constantly irritated by mastication. You have an operation in comparison to which the removing of an adenoid, a tonsil, or any minor operation pales into insignificance.

True, we are told the mouth is immune from infection and that wounds therein rapidly heal, but remember that it is only from the natural flora of the mouth that these tissues are immune, and not the bacteria which may be carried into it by food, dust, and other things too obvious to mention.

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*Read before the Illinois State Dental Society, May, 1915.

If the general surgeon were to attempt any such operation he would prepare his patient for days; have him in a hospital, and a trained nurse in attendance, and keep him under observation until the wound was healed; also he would have him under a general anesthetic and be able to operate with deliberation and precision that should guarantee success in every case.

Now let us see how the dental surgeon receives his case: The patient enters, "Say, Doc, I have got a bad tooth ache; can you pull it without hurting any? I have the worst teeth to pull you ever saw, and I cannot stand any pain. This tooth has ached for two weeks, but I just can't bear to have anything done to my teeth." The dentist smiles, and invites him to be seated, examines the tooth and if he decides to extract, proceeds in about the following manner: "Now, this will not hurt you very much, and you will forget all about it tomorrow"; thus adding his influence in belittling the operation.

If he is very particular he will grasp a piece of cotton or gauze in the dressing forceps and dip it in some alcohol (seventy per cent, *maybe*), wipe off the point of the gum where he will insert the hypodermic needle and then turn around to pick up his syringe (in the meantime the patient carefully explores the gum with his tongue), and proceeds to inject; then selecting the proper forceps places them carefully over the tooth and forces them up with all his might; thereby forcing the deposits that may have accumulated for years (I will not attempt to analyze them), into the soft tissues, grasps with a strong hand and in nine out of ten cases removes the tooth, in the other crushes it with the surrounding tissue into a pulp. Then with elevators and root forceps proceeds amid squirms and groans to remove the pieces. Gives the patient a glass of water from the hydrant and tells him that it will be all right in a few days. If there should be a secondary infection he tells him that he must have caught cold; otherwise he does not see why the wound should be sore. Perhaps I have overdrawn this a little but you have only to look back to incidents in your own practices to find many parallel cases.

Now let us see if we can find a better way, impress on the patient that the extraction of a tooth is no simple operation, that it requires skill and care and that the result may be serious if not properly performed; then quiet the pain, put the tooth at ease, give a cathartic and send him home until the next day. On his return proceed to prepare the mouth by cleaning all the teeth, washing out the nose and throat, rendering the field as asceptic as possible. That this cannot be complete is no reason that it should not be attempted. Have all instruments and hands sterilized as carefully as for a major operation; now proceed as the case indicates, using a general or local anesthetic as desired. Be sure that there will be no pain and that you will have plenty of time to do the work thoroughly. Remove all of the tooth, using no more force than is needed, and if it is necessary to lacerate the gum, dissect it out of the way, so that there will be no contusion of the soft tissue. Carefully wash out the wound with sterile water and replace the gum tissue in normal position; dismissing the patient for the day. The patient should be fed with soft food until the wound is healed. The dentist should see the case every day until there is no danger of a secondary infection.

I know you will say that the patient will object to the trouble and be unwilling to pay for it, but I believe that when the patient understands the seriousness and importance of the operation these would be secondary considerations. In the meantime work towards this end.

Within my memory the public went to the jewelers and traveling peddlers for their glasses, but now the oculist has no trouble in getting good fees for his services and the patient is satisfied. The first thing is to realize the seriousness of the operation ourselves and then educate the public. This is an age of education; the people are awaiting the teachers; it is up to you.

In conclusion I can see it in no other light than that the general surgeon is either a charlatan and working for effect, or the dentist is carelesss and not giving the people the best that is in him.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-FIRST ANNUAL MEETING, HELD AT PEORIA, MAY 11-14, 1915.

DISCUSSION ON THE PAPER OF DR. ROGERS, "WHY FILLINGS FAIL."

Dr. M. L. Hanaford, Rockford:

I am asked to supplement Dr. Rogers' paper by giving some reasons why fillings fail. Three classes of reasons occur to me.

1. Poor judgment of the operator: (a) as to form of cavity, (b) as to choice of filling material, and (c) as to adaptation of kind of operation to a given patient.

2. Lack of ability: (a) to know what is required, (b) to perform in a mechanical way the thing correctly chosen.

3. Dishonesty of the dentist: (a) in not giving time enough to case, (b) in not providing himself with proper equipment, (c) in using poor materials, (d) in saying, thinking or implying that an operation not thoroughly good is "good enough for the money."

To these might be added a number of causes beyond the control of the operator—unavoidable accidents, as traumatisms, serious decline of powers of resistance due to failing health of patient or grave mental disturbances which may break down the barriers and allow dental diseases, caries and others, to run riot for a time. Of these I cannot doubt that the most prolific cause of failure of fillings is that of dishonesty. Now, that is a harsh word, but I know not what else to call it. Can it be possible that in these days of advanced teaching in the schools, of uncounted dental societies, to say nothing of the literature of the profession which comes every month, filled with well-written descriptive articles, beautifully illustrated, every man of us does not know the correct principles of filling teeth? Well then, is it not dishonest to disregard this knowledge when serving professionally a fellow man, woman or little child?

Think of the man in your town whose operative work you know to average bad. Can he not talk glibly of "extension for prevention," of "flat seats," of "immune areas," of "step anchorage," of "beveled enamel margins, contact points," etc., etc.?

Unless your experience is different from mine, he certainly can. Then why, in the name of conscience, do his fillings drop out or leak or overhang margins, and wear rough, destroy pulps, fail to restore contact, etc.? No reason in the world except his love for and chase of the almighty dollar, and that's dishonesty. He knows and is capable of doing better.

> "All are not just who do no wrong,
> I praise not him who pilfers not
> When he might plunder and defy surprise.
> His be the praise, who looking down
> Upon the false judgments of the partial herd,
> Dare to be, not merely to be thought,
> An honest man."

Dr. E. H. Allen, Freeport:

After what Dr. Rogers and Dr. Hanaford have said, there is very little left for me to say regarding why fillings fail. It is an old subject. There have been volumes written upon it. If the Archives of Dentistry could be delved into, we would find a large mass of literature on the subject and still fillings fail today.

Dr. Rogers in his well written paper has given us a great many reasons why they fail. I think uncleanliness is one of the fruitful sources why we have failure of fillings, and even fillings that are put in on the plan of extension for prevention may fail because they are not kept clean. Patients do not keep their mouths clean, and how can they expect to get good results from the work of the dentist under such conditions? Many times the dentist is at fault because he does not continually pound into his patients the importance of keeping the teeth clean. We should shoot in this information at every opportunity, and even though this is done we will find some patients who come back for other operations with their teeth in a very unclean condition, with food packed around and in between the teeth, especially back of the buccal surfaces of molars. When you call their attention to the fact that they do not brush the teeth, they say that they do brush their teeth. I think we should show them how to clean and how to brush their teeth. It is a good object lesson for them.

Careless and slovenly methods, causing leaks in cavities, are responsible for the failure of many fillings. Some dentists have a reputation of doing their work painlessly. If a dentist causes a patient a good deal of pain in order to do good thorough work, perhaps he should get an analgesia outfit or use Dr. Buckley's desensitizing paste.

Poor judgment is often exercised in the choice of filling materials. That may not be always the fault of the dentist because sometimes the circumstances of patients will not permit him to use the proper filling material. For instance, we may put in a large amalgam filling where we should put in a gold inlay, but the circumstances of the patient will not permit a gold inlay, and most of us cannot afford to put in large gold inlays and lose money on them.

I am a firm believer in prophylaxis. Some of the most trying and perplexing cases I have ever had have been greatly benefited by prophylaxis. I have given them the treatment once every month; I go over the teeth and polish them and scale them, and I am getting good results. I feel encouraged in that work.

Dr. C. L. Snyder, Freeport:

The essayist referred more particularly to why good fillings failed. That is a point I want to bring out and emphasize. The interproximal space is the thing we should take care of more particularly. I do not care how well you put in a filling, if you do not have proper interproximal contact the operation will be a failure. The filling may remain intact but the tooth or teeth may come out, and to these cases we may often trace pyorrhea. If food, by mastication is crowded into the interproximal spaces, this of itself will produce such a condition of the gums as to cause the loss of teeth.

Dr. Allen, in his discussion referred to prophylaxis; this is an important factor in the life of fillings. Patients should take proper care of fillings after they are put in; if they are unable to do this with the use of a tooth-brush, they should go to a dentist and have him care for them. By so doing many fillings may last a lifetime, whereas if putrescent material and food stuffs are allowed to cover fillings, we must expect those fillings to fail.

Dr. B. J. Cigrand, Batavia:

I would like to call attention to a few points. In the first place, dentistry is no longer a separate profession, but it is absolutely a part of the medical profession. I wish to tell you why there is benefit to us from that. There are medical gifts being given in various sections of the United States, and the one I especially refer to is that of the Mayo Brothers, of Rochester, Minnesota, a very large gift of money having been given for medical research already, and I wanted them to include also dental research, because they intend to build an enormous laboratory in which possibly millions of dollars will be spent. They will gather together the most expert researchers, microscopists, histologists, bacteriologists, and the very best men they can obtain, and I desired to know whether there was a possibility of including dental research. They have replied, by saying that in the donation which has now been given it is strictly for medical purposes. If we had been recognized as a part of medicine, I believe we would have had the advantage of this enormous donation, and the same thing applies to the Rockefeller donation, and the same applies to the recent one given in England. If we have lost these opportunities, it is our own fault. We are excluded because we have been for years heralding the idea that we are a separate and distinct profession, independent of the medical calling. We are not true to facts when we voice such arguments. We are absolutely a part of medicine, and how any one can get on the floor and say we are separate and distinct, I cannot comprehend. Our training, our fundamentals, our basis is medical. We ought to be glad and proud of that fact and the mother profession can be of great service to us. If such research could be carried on, then we might begin to understand why fillings fail, because laboratory research would teach us where we fail.

We are expecting men like Dr. G. V. Black, Dr. Noyes, Dr. R. Ottolengui and other great leaders to do these researchings for us. What have we done for them? What amount of money do we personally or collectively give them to prosecute this research work? Absolutely none, and hence it is time for us to say, that dentistry is part of medicine, and get the benefits of what we are. This idea of making practitioners believe we should be aloof from the medical profession is not only an ingratitude to them, but an injustice to ourselves. The most important suggestion that I would add to the purpose of this paper is that our research work should be done in connection with these foundation laboratories and they will teach us why we find fillings fail.

The sooner we individually and associatedly realize that we are preventing humanity from receiving full benefits by our narrow, false and illogical stand the better it will be for not alone the human family but for us as well, and the medical profession too will reap a harvest of good by having men of our profession in this conjoint service of investigation. The government at Washington too would be far more eager to lend us a helping hand in these problems if we worked through the Surgeon General's office which is classed as Medical in the government arrangement. We have stood alone long enough, partly by our own choice, though in a measure because leaders of both professions did not comprehend or failed to understand the true situation. While my remarks may seem distant from the subject, yet you can realize that our knowledge as to why fillings fail will be considerably increased if we can get medical aid, both from the various laboratories and the government as well.

Dr. Edmund Noyes, Chicago, was called for:

I do not think I have anything to say at this time in regard to this excellent paper. I would suggest to Dr. Cigrand, however, that had he been here yesterday he would have seen the beginning of some financial provision for research by the dental profession.

Dr. Rogers (closing the discussion):

As the hour is very late and you have been here a long time, I will close by simply thanking the gentlemen who have discussed the paper so kindly and for the marked attention you gave me in listening to it.

DISCUSSION OF DR. TESKE'S PAPER ON "EXTRACTION OF TEETH AS A SURGICAL OPERATION."

Dr. J. E. Hinkins, Chicago.:

On the whole, I agree with the essayist in regard to the various points he has brought out in his paper. There is very little that I can criticize except that he has not been as emphatic and forcible as he might have been with reference to certain points. It is quite true that the operation of extracting teeth in days gone by has been underrated and belittled both by the dentist and the patient. It is not always true that dentists send patients to specialists to have their teeth extracted in order to remove any unpleasantness from the office in connection with such work. Not infrequently, however, many dentists send patients to those who make a specialty of extracting teeth. These cases are referred to them for extraction on account of their great and unusual skill in this particular line. As we know that the general practitioner of medicine frequently sends patients to a surgeon in order that any operation which may be required can be performed with great skill, so great care and unusual skill are absolutely essential in extracting teeth to guard against undue laceration of tissue and the opening up of avenues of infection. The dentist who extracts teeth indifferently and carelessly is liable to damage the tissues of the mouth very severely.

I believe with the essayist that the extraction of teeth is just as important an operative procedure as the removal of adenoids or tonsils, or any minor surgical operation. In either case the operator has to be exceedingly careful about his asepsis, and it is very essential for him to exercise great caution not to damage the tissues by unnecessary manipulation. While it may not be necessary to prepare a patient for days before extracting his teeth, the same as a surgeon would prepare his patient days in advance for a major surgical operation, still the dentist needs to be careful about his preliminary treatment as well as after treatment in all cases in which he resorts to extraction.

The patient should have impressed upon him the important point that extraction is by no means as simple an operation as was formerly supposed. It is an operation that calls for skill, and if it is not properly performed the result may be fraught with a good deal of danger. The sterilization of the hands of the operator and instruments should be as carefully carried out as for a surgical operation. Any defect in the technic of the operation may be serious to the patient. Where several teeth are to be extracted, it is better to use a general or local anesthetic, thus giving the operator sufficient time to do his work thoroughly. As each case is a law unto itself, the operator can best determine in the individual case whether a general or local anesthetic is needed.

Local and general anesthetics have been employed for years and years in the extraction of teeth and for other minor operations on the oral cavity. But only within the last few years has nitrous oxid and oxygen been employed to any great extent not only for preparing sensitive cavities but for extracting teeth. Many people are loath to visit the office of a dentist on account of the great fear of pain, and as a rule, they do not consult a dentist until pulps are exposed or abscesses have formed, and then they are compelled to do so. By employing nitrous oxid and oxygen to relieve pain or Dr. J. P. Buckley's paste, the dentist can thoroughly remove all carious portions from the teeth, prepare cavities more thoroughly for such fillings as are to be inserted, and do more work in the same amount of time with a degree of satisfaction which can only be appreciated by patients who have availed themselves of modern dentistry.

With reference to the hygiene of the mouth, I cannot emphasize too strongly its importance. The physical examination of school children shows that in many instances the teeth are in a decayed and unhealthy condition. Decay of the teeth causes an unclean mouth. Toothache and disease of the gums may result.

The essayist has the right idea with regard to the education of the public. The public should be impressed with the important fact that neglect of the first teeth is a frequent cause of decay of the second teeth. If a child has decayed teeth, it cannot properly chew its food, and improperly chewed food and an unclean mouth cause bad digestion and consequently poor general health. The public should be taught that if a child is not in good health, it cannot keep up with its studies at school. It is more likely to contract any contagious disease, and it has not a chance to grow into a robust, healthy adult. If the child's teeth are decayed, it should be taken to a dentist at once.

Sir William Osler in addressing a body of dentists some years ago said: "You as dentists have one gospel to preach and you have to preach it early and late, in season and out of season. It is the gospel of cleanliness of the mouth, cleanliness of the teeth and cleanliness of the throat. These three things must be your text throughout life. Oral hygiene—the hygiene of the mouth—there is not one single thing more important to the public in the whole range of hygiene than that." Again, Dr. William A. Evans, of Chicago, has laid great stress on the relations of the secretions of the mouth, of the cavities accessory to the mouth, to scarlet fever, to diphtheria and to measles, to which, he said, with perfect propriety can be added consumption, pneumonia and common colds.

We know that the bacilli of infection lurk in the crypts of the tonsils, in the mucous membranes, around the roots of teeth, around the gum borders of teeth, and in the cavities of teeth, and contagion is carried from one person to another through these means which we have hitherto overlooked. Probably of greater consequence is the possibility of the spread of contagion in cases of pneumonia, common colds, and consumption. The work of the dental profession, the question of teeth cared for and teeth uncared for is, therefore, a matter of great concern in the prevention of the spread of contagious diseases.

Finally, when the public is taught to understand the relations which the mouth bears to the general health, and we as a profession concentrate our efforts in teaching the proper care of the teeth and the use of the mouth, the number of cases of extraction will become less and less.

Dr. E. L. Burroughs, Edwardsville:

Today we find ourselves facing a crusade against the retention of pulpless teeth; in other words, for wholesale extraction, with little regard for professionalism, less for surgical ethics and asepsis, and very little feeling for the unfortunate victims. With the kindly permission of the author, I beg to quote from a recent editorial in the May number of the Dental Review: "If this panic of extraction is to continue, God help the people."

It might seem a little strong to say that every case of extracting is a surgical operation; but as a rural practitioner, where I have to meet all classes and conditions, I encounter no operations that demand more real skill and ability, for the same given time, compared with other operations in dentistry, than that of extracting. Whether you call it a surgical operation or a minor operation requiring physical exertion, matters little,—but unto him who does it well, all praise and honor is due.

Nor do I find any other condition in the mouth where the possibilities of infection are greater than that of extracting. In many of these operations, we have infected areas to begin with, on and around which we are obliged to work, to say little of the deep-seated cavities left to be filled with debris, there to remain, decompose, and increase the amount of infection, the patient returning only when the area of infection has increased and the pain can no longer be endured. Hence I heartily agree with our essayist when he says that too much has been said and done to belittle this very important task.

The theory of dentistry is one thing; the practice of dentistry is another. The practicability of a condition often causes us to deviate from the ideal. In this respect, I wish to take issue with our essayist. Many of us are general practitioners; many of our patients are busy people. Many of the operations in extracting are emergency cases, requiring much time, untiring effort and energy on the part of the operator, to give even temporary relief, to say nothing of the pain to the patient. Can we not serve these patients better by doing the operations then and there, exercising all the care that any surgeon would in an emergency operation?

That the public needs educating and enlightenment as to the seriousness of extracting and the many ill effects resulting from inefficient service and neglect, there can be no doubt. But so long as members of our honored profession play the part of a charlatan who, primarily to afford increased opportunity of making artificial dentures that a little more lucre may be added to the office income, offers to extract gratuitously and thereby holds out an easy temptation to deprive humanity of its masticatory organs, then we, the exponents and professed disciples of humane and modern dentistry, are proceeding in the wrong way to educate the public. Not until we get together on this proposition and educate ourselves to perform better and cleaner operations, can we expect the public to "rise up and call us blessed."

CLINICIAN'S REPORT.

CLINIC COMMITTEE: T. A. BROADBENT, CHICAGO. W. F. WHALEN, PEORIA, CHAIRMAN.

Truman W. Brophy, cleft palate. Surgical clinic. Operation consisted in closing complete cleft of the palate in boy ten years old.

Frederick F. Molt, radiography. Made about fifty radiograms of actual cases and displayed the developed negatives, pointing out pathological conditions shown.

William H. G. Logan, surgical operation under anesthesia. Patient had been suffering from chronic infection of the antrum for about a year, with previous operations performed. Under general anesthesia a radical operation was performed upon the antrum.

Frank H. Skinner, oral prophylaxis. Showing the use of staining or discoloring solution for locating foreign substances on the surfaces of teeth, and removing deposits and polishing out etched surfaces which would have become cavities if left.

Josiah S. Bridges, chemical treatment for pyorrhea. The clinician gave a chair clinic showing method of taking a culture from the infected area, demonstrating the presence of staphylococci or streptococci. He also presented culture sheets from clinical laboratory showing staphylococci or streptococci absent after treatment. The treatment consisted of a liquid containing H_2O_2, trichloracetic acid crystals, adrenalin chlorid, normal salt solution. This liquid is used after thoroughly scaling the teeth by mechanical means. Following the liquid, a paste was applied by special syringe. The infected area was isolated and completely dried before applying same. A paste made up of the following ingredients: Zinc oxid, bismuth subnitrate, magnesium sulphate, Tr. iodin 35%, aconite U. S. P., eugenol, phenol 95%, lanolin. A special advantage claimed for this treatment is the fact that the disinfectant is persistent and remains discernible days after application.

The formulæ of these prescriptions are not given because the compounding of them has not been perfected to obtain uniform results.

J. T. Search, office and laboratory helps.

(1) COTTON HOLDER.

Used in connection with treatments of root canals. Consists of an inexpensive finger ring with metal plate and pin soldered transversely in a manner to hold securely a small sized cotton roll. The center of cotton roll to be pulled out so that the long, clean fibers are easily picked away in just the quantity desired.

The ring is most conveniently worn on the little finger of the right hand, and is sawed through on one side—the end nicely rounded and polished—so it may be adapted to any size finger and easily put on and off.

(2) CHUCK FOR LABORATORY LATHE.

Solder to a common brass chuck of an S. S. W. or Ritter lathe a brass plate ⅛ inch thick and 1½ inches diameter, place upon lathe and turn true. Screw fast to this plate a block of well-seasoned soft pine 4x4x2 inches; again place on lathe and turn true with small, sharp chisel. Make a transverse cut in one edge ¼ inch deep.

Order of any one-horse "shoemaker" a roll of garnet paper 1¼ inches wide and 75 feet long—cost about 75 cents—cut off piece long enough to roll three times around wooden chuck. Place one end in transverse cut and with flour paste containing glue stick it on evenly. Wrap with strip of cloth to hold in place over night.

I couldn't keep house without one of these chucks. Its grinding capacity will surprise you in cutting down the "rough" of Vulcanite plates, grinding down any sort of tools—except the finest—putting, in a jiffy, a long slender point on slate pencils used in soldering operations and a multitude of other ways.

(3) PULLEYS ON ALL CORD RITTER SUSPENSION ENGINES.

Modified to obviate that most annoying tendency of the all cord to blacken whatever it touches after the nickel has worn off in brass pulley groove.

Remove cord from pulley, set motor in motion and with small, sharp turning tool, made from small file, split pulley and remove inner half. Dress remaining face to accurate plane, attach with set screws a pulley made from 3/16-inch vulcanite or vulcanized fiber, turn accurately, being *very careful* to cut groove so a new cord will just enter and narrow groove very gradually to a square bottom ⅛ or 3/16 inch deep.

(4) AID IN FITTING LOGAN AND DAVIS CROWNS.

Fold small sheet heavier grade of carbon paper to form a strip ⅜ inch or wider and several thicknesses. With dam punch perforate every half inch. Cut away folded edges, thus separating strips.

Slip pin of crown successively through these holes and press crown to position. Blackened portion to be ground until fit is as perfect as can be made.

J. A. Heaton, Hoopeston, Ill., the porcelain gold shell crown. Table clinic.

If devitalization is necessary, a pin should be placed in the canal, letting it extend almost to the occlusal surface. This is for added strength. Remove all enamel. Cone-shape the dentin according to requirements. Construct platinum jacket by taking measurements as in the construction of the Richmond. Cut the platinum (1/1000 gauge) about $\frac{1}{16}$ inch longer than measurement to allow for over-lap in soldering with pure gold. Only the end placed to the base of the root need be soldered. Split the other end of the tube about four times to allow it to be drawn in around the cone-shaped root. Burnish well to the base and sides, that perfect adaptation be secured.

Select facing: Concave the surface in contact with the root according to amount required for the correct adaptation, letting the pin in the root find its place between the pins of the facing, if occlusion will permit. Back facing with platinum, as this will admit of a very close adaptation to the root. Place a small amount of sticky wax on the platinum cone at the point in closest contact with the facing. Heat facing enough to cause the wax to adhere when it is placed in position.

Remove and cone and facing will come together. Invest as in the construction of the Richmond. Heat and solder, using the amount of solder required to fill space and give strength.

You will have a crown which is perfectly adapted. You will never have a split root. It is easily and quickly made. You can make any attachments to it that may be desired.

J. E. Hinkins. Excused on account of illness.

A. B. Patterson. Table clinic. A method of filing dental skiagraphs.

This clinic showed a method of filing and preserving dental skiagraphs. As soon as the film is dry, it is mounted on a card of celluloid, this is placed in a manila envelope which is made to fit a standard filing case.

The celluloid cards, which have a "frosted" finish and can be made up in any size, in this system measure 3x6, and by means of slits cut in the card, permit the mounting of three films, coated side in. A printed line is provided for the patient's name, case number and dates.

The manila envelopes measure 4x6, are open at one end and thumb cut, a printed line is provided for the patient's name and the case number, and the remaining space is ample for recording the history of each skiagraph. These envelopes are stiff and can be filed in any standard 4x6 filing case.

George E. Meyer gave Dr. H. A. Potts' clinic. Conductive and infiltration anesthesia.

The head of a cadaver was prepared to show the manner in which needles should be introduced in the various locations for the production of local anesthesia, both conductive, infiltration, and also a combination of both. The dissection showed the points of the needles in their respective positions relative to the nerve trunks, as well as the positions of the points of needles introduced to their proper positions when injecting alcohol for the relief of tri-facial neuralgia.

The dissection also showed the relations of the various sinuses to the oral and nasal cavities, as well as their relations to each other.

The amounts and strengths of various solutions of novocaine and adrenalin were also shown, as well as the Fischer syringe which is used in this work.

G. Walter Dittmar substituted for F. E. Roach. Clinician exhibited specimens showing various forms of clasps and attachments.

Demonstrated making the various forms of the Roach wire clasps and showed how the Roach attachment must be modified to be effective when anchorage is made to but one end of a span.

Clinic demonstrated many of the points made in the paper presented by Dr. Charles W. Coltrin and printed in these proceedings. Title, "A General Consideration of Removable Partial Dentures and the Various Forms of Attachments, Having in Mind the Conservation of the Remaining Natural Teeth."

Harry F. Lotz. Time records.

A system by which one can know how many productive hours he has in his office during a year. Exhibit, Kirby time slip.

Alpha B. Applebee. Retaining appliances in pyorrhea cases.

An appliance particularly adapted to the retention of lower anterior teeth, where a portion of the process and tissue has been destroyed by pyorrhea.

Consists of removable bands, fitting bicuspids, with small cast or soldered lingual bar adapted to lingual of anteriors.

The various teeth devitalized and held firmly in position by gold screws placed through bar and entering lingual surface of teeth to be retained, this making a permanent splint, utilizing the natural teeth.

This method of retention permits the necessary prophylactic treatments required at intervals after it has been placed.

Louis Schultz. Conductive anesthesia.

Demonstration was made on a skull and on a head.

The anatomy of the parts involved was considered first, stress being laid on those branches of the fifth nerve concerned in the work, and these were demonstrated on a skull. Then followed a consideration of the proper technique to insure asepsis, such as sterilization of the field where the injection is to be made, treatment of syringe and needles, preparations of the solution to be injected, etc.

The demonstration ended by an exhibition of the different methods of inducing anesthesia. The methods considered were first, conductive anesthesia; second, infiltration anesthesia; and third, intraosseous anesthesia, indications and contra-indications being given for each. The clinician used the head of a cadaver for this purpose, inserting the proper needle at the point under discussion.

J. B. Donelan. Table clinic. Several useful hints.

Large felt cone cut in two pieces to make hard, useful cone without any waste of cone.

Using cement on occlusal surface of bicuspids and molars to keep teeth apart when third molars are erupting, and keeping teeth from striking tissue over third molar. Can also be used in cases of apical pericementitis.

Showing the use of linen thread to rotate upper lateral.

Edgar D. Coolidge. Root canal technic.

The purpose of the clinic was to demonstrate a technic of opening root canals and filling them. The opening into the tooth should be large enough to allow free access to each canal, regardless of the sacrifice of sound tooth structure. In many molars, on account of the curving of the roots distally, it is necessary to cut away some of the mesial surface in order to enter the mesial canals in a straight line. The mesial cusps should be cut away freely in all cases to allow access to the opening of the mesial canals. Extreme care must be used in entering the canals with broaches to avoid making a pocket at a bend in the canal or when any obstruction is encountered.

The smooth broach can usually be gently worked into the canals, sometimes using sodium and potassium as an aid in dissolving out organic matter from the calcific deposit. Next a broach roughened by rubbing two files over it may be used to file out the obstructions and enlarge the entire length of the canal, followed by barbed broaches ranging from the finest to one quite coarse to enlarge the canal sufficiently to allow the canal pluggers to enter. Instruments which are to be twisted or used on the engine must be used with extreme care or they will leave the canal and form a pocket beyond which it is almost impossible to pass. The opening of the canal may be enlarged with pointed burs simply to facilitate entering. At this stage it is always wise to place a broach in each canal and take a radiograph to see if the canal is open to the apex.

The technic of filling the canal was also discussed. The canal should be moistened with eucalyptol, followed with thin chloropercha and a cone inserted which would reach the apex of the canal, and should be worked up and down many times to drive the cone and chloropercha to the apex. Canal pluggers of the proper size to reach close to the apex should be used to plug and pack the cone into the apical third of the canal to make a solid, tight filling. If any doubt exists whether the apex has been entirely filled, a picture may be taken at this point before filling the remainder of the canal.

The remainder of the canal should be packed with short pieces of gutta percha cones cut at the desired length and carried to place on a heated canal plugger. This will make a very solid filling and one which, if completed under aseptic conditions, will have the greatest opportunity for success.

F. M. Rittenhouse and Frank J. Ryan. Amalgam clinic. Table.

The amalgam clinic illustrated technic as advocated by Dr. William E. Harper. Quick setting alloy used, previously weighed into 10 and 15 grain capsules, with proper proportions of mercury in other capsules, varying with the different makers' alloys, as per their printed directions accompanying the same.

Alloy and mercury placed in deep glass mortar, inner surface dulled, a long-handled similarly dulled pestle used, the mix rubbed as rapidly as possible for two minutes by the watch, and then kneaded in hand one minute. Excess of mercury is left in mix, which should be extremely plastic, and packing proceeds, using large serrated pluggers to commence the filling, stepping from center to and around the walls, packing thoroughly, scraping off excess of mercury expressed to the surface during the packing.

This procedure continues, using smaller serrated pluggers as required until the filling is finished, leaving a surplus covering margins, after which it is trimmed to margins and lightly burnished, the polishing to be done at a subsequent sitting. A well-fitting matrix is essential where one of the surrounding walls is missing or perfect adaptation cannot be secured.

Adolph E. Schneider. Table clinic. The technic of making a porcelain jacket crown.

My first model represents the amount of tooth structure I would remove from the incisal of a central in preparing a porcelain jacket crown. The dark line represents a depth slightly deeper than the cemento-enamel junction.

The second model represents in a like manner the amount of tooth structure I would remove on the mesial, distal, and incisal. The third model represents the amount I would take off of the labial and lingual.

The fourth model shows the depth and position of the shoulder that is to be prepared on the tooth for the reception of this crown, and should be cut with a 57½ or 58 S. S. White Revelation burr. This shoulder is placed as far under the free gingivae as possible. In the specimens so far shown is also illustrated the proximity of the pulp to the tooth preparation, which shows ample protection from pulp denudation.

Before the shoulder is cut, take a wire measurement of the circumference of the neck of the denuded dentin, just as you would take a measurement for a gold shell crown. From this measurement prepare a band of copper matrix material that will fit the neck of the tooth, just as a gold band would which was contoured at the gingival, except that the band protrudes, incisally, about three millimeters beyond the incisal edge of the tooth. Cut the band incisally at the mesial and distal, both labially and lingually. Cut off the lingual or soldered flap. Bend the labial flap lingually at right angles. Compress the lateral sides, cut off the excess copper, and soft solder same. This should give you a cup that would hold the modeling compound for the individual impression of the prepared tooth. Fill the cup with Detroit Modeling Compound level full, and vaseline it and lay aside for future use.

At this time, prepare the shoulder on your tooth. Have the assistant direct a stream of air against the tooth in such a way that the gum will lie away from the tooth sufficiently to allow free access underneath the free gum margin.

Now warm the cup of compound and force gently over the prepared tooth, until the cup passes beyond the shoulder. Hold it in this position, until thoroughly chilled, remove carefully.

With S. S. White's extra tough pink wax (Tenax) take an accurate mush bite of your prepared tooth. This will give you the relationship of the prepared tooth to the approximating teeth and to the opposite bite.

Over the prepared tooth build with Evan's gutta percha cement a gutta percha crown and see that it protects the shoulder from the gum, otherwise the gum very easily grows over the shoulder, which makes it very difficult to properly set the crown. The patient may now be dismissed.

Into the individual cup impression, build up with thick cement a cement root. This is done by mixing your cement heavy enough, so that you can roll it to a point in your fingers, without sticking to them. Place the point of the cement deep into the cup and with an amalgam plugger, pack it to place as you would amalgam. Build the excess cone shape to simulate the root of a tooth. This also makes it easy to handle while molding the matrix. The cement having hardened, heat the cup slightly and remove it. Trim the root so that it will be cone shape toward the applicable end. Place this root into the wax bite and see that it is firmly seated. Run this impression up in plaster. Trim model and separate.

To mould a matrix, take a one pwt. piece of one one-thousandths pure platinum foil and divide it in the middle lengthwise. Cut each one of these pieces on the diagonal four times and this will give sufficient platinum for ten matrices. Take the cement root from the model, and against it place, diagonally, a piece of the platinum.

If properly placed, the matrix will be amply large to fold about the root with an excess lingually to allow for a stove pipe joint, or a double lap fold.

The first model of this section shows the matrix as it is first placed against the tooth, the second model shows the matrix cut incisally at the mesial and distal extremity of the tooth. The next model shows this incisal flap drawn over the incisal and down the lingual surface.

The next model shows the matrix with the excess drawn from the labial to the lingual. The following model shows the matrix fairly well moulded and the excess protruding at right angles from the center of the lingual surface. As the excess necessary is but a millimeter in depth, cut off all but that much.

With the gold foil pliers S. S. White No. 6, grasp the matrix to half the depth of the excess and bend it for the first part of the double lap, at right angles to the original excess.

The next model shows this initial excess, turned down so that the excess is now doubled and still at right angles to the lingual surface. This excess is now turned down once more, flat on the lingual surface of the tooth and this finishes the double lap.

At this point remove the matrix from the root and trim the excess entirely from the incisal and leave about one millimeter excess beyond the shoulder at the gingival. Replace the matrix on the root and with an inlay burnisher, burnish from labial to lingual until the matrix takes every imprint of the prepared tooth. In other words, fits the root perfectly.

At this point you are ready to apply your porcelain. Lay out on a glass slab the two colors that go to make up your crown. Begin your building by covering the shoulder with the gingival coloring and building it incisally as far as you wish the yellow coloring to extend in the tooth.

Over this apply the incisal coloring and extend this gingivally over the yellow, as far as you wish the incisal coloring to extend. Place the tooth into the model and build to contour. Remove it carefully, place it in the oven, and fuse.

If porcelain is properly handled, the case will come out complete in one bake.

The last model shows the crown complete on a root in the plaster model, built to contour and color.

E. L. Burroughs. Practical Hints for Office Practice.

This clinic was for the purpose of showing some of the little things that will occasionally help both patient and operator in everyday practice.

I. Use of S. S. W. steel matrix strip 5 inches long. Coil one end around tooth to be filled, having a double thickness on side away from the cavity and a single thickness in side with cavity, using a cotton wedge to keep matrix up to the gingival margin. Then pass the uncoiled portion of the strip toward the front of the mouth, slipping it between one or two of the incisors for support, allowing the end to project out of the mouth, thus leaving the operator with both hands free with which to work.

II. An easy method for separating teeth: Take a piece of waxed floss silk, 8 inches long, through the center wrap a few fibers of cotton or bibulous paper, about 1 inch in length, until about the thickness of ordinary wrapping cord. Saturate with chlora percha, allow to dry for a second and then pass floss silk between two teeth to be separated, at gingival margins, until the enlarged portion is equally spaced labially and lingually. Bring free ends together and tie firmly over the incisal edges. Do not use surgeon's knot.

III. Method of restoring badly broken down lingual wall with an enamel filling, having little or no polishing after inserting filling: Prepare cavity, rubber dam in place. Press a small piece of modeling compound against lingual walls of tooth to be filled and the adjoining teeth as well. Allow to harden, remove, trim off excess modeling compound that has pressed into the cavity. Then pass thin celluloid matrix strip around tooth and cavity to be filled, replace piece of modeling compound to original position and hold firmly; insert filling as in any ordinary case and allow to harden. Upon removal of the compound and matrix little or no polishing will be necessary on the labial walls.

Fred R. Felcher. Goslee Teeth and Protesyn.

My clinic demonstrated the use of the Goslee interchangeable teeth in connection with protesyn porcelain. I exhibited two cases of plate work and one six-tooth lower anterior bridge, using the protesyn in reproducing the lost gum tissue.

Using Goslee teeth in this kind of bridge work allows the reproducing of a more natural tooth in length, as a tooth closer to the natural size can be used. The exhibition of gold is entirely eliminated and a stronger tooth can be used. Its advantage over the long pin facing tooth, so liable to fracture in a normal bite, can then be readily appreciated.

The stability of the protesyn is assured providing deep retention is made both under the anterior parts of the teeth and the lower gold small saddle resting on the slight area of gum tissue.

In all cases of Goslee teeth, proper backing by means of a good swager of 36-gauge pure gold (no casting), and being positive the pin is so cut as to leave a space between it and the floor of the "pin hole," which is later filled with cement, and which in turn acts as a cushion, must be imperative in order to secure strength of the work.

Walter L. Hyde, Canton, Ill. Orthodontia. Table.

Models of deciduous teeth were shown to bring out the following point: Although the deciduous teeth may be in alignment, if they have not spread apart, but stand close together, at the time the permanent teeth are ready to erupt, there is an irregularity and malocclusion is sure to result.

T. J. Foley. Table. The Cast Base Porcelain Crown.

The selection of a porcelain crown or facing for the case in hand is of vital importance. In describing the selection and construction an upper central will be used, as the same steps apply to any of the ten anterior teeth, both upper and lower.

The curvature of the gum tissue corresponds approximately with the curvature of the gingival line, but in the interproximal spaces it is greater in healthy gum tissue.

The free margin covers from one to three millimeters of the enamel.

There are a great many cases where there is an extreme curvature of the gingival line, especially in the lower incisors and cuspids. In such cases the Davis or detached post crown is contraindicated, especially where a cast base is used. The crown could not be constructed without grinding below the gingival line, causing injury to the peridental membrane.

By the use of a porcelain facing Steele's, Goslee's or similar tooth you have no irritation or inflammation that might lead to pyorrhea.

Preparation of the root: The remaining crown portion of the root should be excised. Root finished down to the gum with carborundum stones, then with safe sided root facer and gum protector extended slightly below the free margin of the gum, not flat, but on the same plane as the gum margin.

A groove is then cut labio-lingually about one millimeter deep and within one millimeter of labial and lingual surface. The sharp angle on lingual half of the surface of root should be rounded with Black's cavo-surface angle trimmers.

Select a suitable Davis or detached post crown, fit post and crown approximately, burnish 36-gauge 24-K. gold over root, insert post and solder to disk, replace on root and burnish, turn up edge of disk with foot plugger and burnisher, making band one millimeter wide all around root.

Grind labial half of surface of crown to fit coping accurately, grind lingual to V shape space, notch tooth crown at mesial and distal to prevent rotation.

Place a drop of engine oil in crown, dry coping, soften inlay wax and press home. Invest and cast.

The groove cut in the root will allow the cast gold to surround the post and stiffen the labial half of the disk. The cast base is then placed on the root and the crown cemented on under pressure. It is then removed, excess cement disked off, labial half of band cut off and finally cemented permanently.

In the use of Steele's facing the same method is used, only the root has more of a V shape.

After the coping is made grind the facing and backing to fit, solder backing to disk, replace on root and burnish, remove, invest and solder with 18-K. gold solder, letting solder extend well over lingual band to stiffen it. Select a facing long enough, as it can be shortened to suit case. Cement facing on first while crown is on root, afterward cement crown.

Dr. J. L. Bischof, Belleville, Ill. Application and Uses of the Bischof-Otrich Attachment. Table clinic.

The most important questions brought forth at the clinic were as follows:

1. The readaptation of the denture following process resorption. The simplicity of this is one of the things that make it popular, which is done as follows:

Remove clasp, place clasp over ball, cut out clasp, seat in plate proper depth, fill in with heated gutta percha and place in position in mouth and cool; this holds clasp firmly and takes the ride off the post and gives proper adaptation to ridge.

2. Regarding wear of clasp: By bringing the flanges slightly together takes up all wear and can be made to fit as tight as in the beginning.

3. Retention force of clasp: About six pounds per clasp, straight pull.

4. The use of single clasps: I gather from comment of other dentists that this is also very practical. The use of the crown saddle attachment on molar abutments is the most practicable by consensus of opinion.

A. Archie Powell. Table. "Selling Service Talk"

"Salesmanship is largely the educating of a prospective purchaser as to what is best for him and why, pointing out his individual needs."

The plan of the clinician is to take what he terms a "bite-impression" in modeling compound, from which to make plaster models. Also note on an examination blank all of the teeth which need attention, or spaces which should be supplied with artificial work. Patient dismissed. In his absence the case is carefully studied as to its requirements. Also an outline made of a Selling Service Talk which is to be given to the prospective purchaser while seated in the dentist's business office. With the plaster models, supplemented by filled and crowned teeth, also bridges, he has presented to him in a comprehensive way his need of dental services.

No effort is made to enumerate the number of "holes" or "spaces" in his jaws. The whole plan is *service;* what the *service* will be worth to him in health and appearances.

The plan is gone over at the desk—never in the dental chair, where there is so much to distract his attention—the cost of *service* is told the patient; the terms of payment agreed upon.

It makes your work more pleasant and profitable. The patients like the plan.

Get these ideas: Don't be a slave to your work. Use your brains more—hands less. Your business is just what you make it.

Think in small figures and you will always remain little.

Would *I* charge the rich more than the poor? Or—would *you* charge a poor man as much as the rich one?

Remember, it's *service* that you are selling.

B. A. Smith, of Champaign; C. A. Colletti, of Chicago. Proof as to Correctness of Anatomical Occlusion. Table.

Bernard J. Cigrand, Batavia, Ill. Emetin and Ipecac in Oral Tissue Disintegration.

One of the essentials in the employment of emetin and ipecac, looking to the cure of inflamed gingiva, is to be diligent in the removal of all foreign particles from about the root membranes.

This procedure will require patience on the part of the operator, since the task should be performed without abuse to the tissues or membranes. The old or recent idea that you can scrape, scratch and scar the peridental membrane and expect retention of the tooth, seems in my estimation a fallacy; hence I advocate careful, kind and perfect removal of deposits or sediments. After this feature of the process is accomplished the major phase has been performed. In the washing or cleansing feature I have obtained splendid results by employing the hypodermic syringes, using the bent points. The reason I use these needles is because with them you can reach parts and pockets readily and again they are small and can be made to dip into the pockets, while the large "squirt gun syringes" are too cumbersome and instead of flushing the pockets they merely wash off the upper surface, leaving the deep-seated part of the cavity filled with debris. The small thin-pointed needles reach down deep into the pocket and arouse and lift up and dispel the debris. Now it is absolutely necessary to know that the needle points must be clean if you wish to inject into these pockets and tissues any of the emetin and ipecac, for if the needle is rusty it will militate against the perfect function of both the tissues and the medicines. The injection of the medicines into the tissues adjacent to the tooth may be indicated when a spongy, soft and inflamed circumference presents itself, though general cleanliness of the entire oral cavity and treatment of all the decayed teeth need to be assured if you wish to reach a reasonable condition promising both relief and cure. You will find that the use of emetol is also splendid as a mouth wash and assists in preventing the reproduction of the ameba, which low form of life seems to be at least one of the disturbing elements in the creation of pathological conditions about the roots of the teeth. While I would not claim that the ameba is the only organism which is the cause of the pus formation in the mouth, it does appear from the successes recorded and the good results obtained when the amebae are removed, that it certainly was a contributing cause and emetin and ipecac do wonders when employed with cautionary measures.

L. L. Davis. Mixing Cements.

The object of this clinic is to demonstrate the effect of temperature in mixing cements, and to point out a way—suggested by Dr. Ames—of securing at *all* times and under all conditions of the thermometer and weather, a uniform mix.

A. W. Rue. Suction Devices to Make Dentures Fit Extremely Flat and Very Difficult Mouths. Table.

Z. W. Moss. Gold Inlay with Synthetic Porcelain.

Finding an extensive decay on the labial surface of a cuspid tooth, extending well under the gum line. Impossible to place the rubber dam without lacerating the gum and causing unnecessary pain to your patient.

This may be overcome by preparing your cavity for an inlay, place your wax and trim just to the gum line, remove, cast, and set to place, then your rubber dam can be applied and your synthetic filling made with practically no gold showing.

P. A. Pyper. An Easy and Quick Method for Taking Impression and Carving Wax Model for Cast Gold Inlay. Table.

Cavities prepared upon general plans for inlay work. Taggart's Wax (or any other good wax) warmed over flame till end is quite soft, leaving other end rather rigid, then forced into cavity. When cool remove without doing any carving. Invest where the tooth was with Taggart Inlay Investment. When set hard carve wax down to the investment tooth, shape to all details, insert spruce in usual place, putting all in water for a few minutes to hydrate, then invest all just the same as if no first investment were there and cast the usual way. Advantages are, first, wax so used can be forced to every detail; second, leaving bulk gives handle to remove impression without distorting wax; third, easier to carve out of mouth and no danger of distorting.

A. Brom Allen. Exodontia. Table.

Natural teeth showing the necessity for the removal of third molars with no occlusion, provided there is a full complement of teeth in the mouth and no loss of teeth anterior to the third molars.

I have observed these conditions in mouths and find that there are few patients where the third molars are thoroughly brushed, and on removal find that the contact of the third to the second molar has started decay, if not already a cavity. So by extraction we eliminate the decay of the second molar and also enable the patient to brush the distal of the second molar, and keep that area clean. If we believe in prophylaxis why should we leave the unclean third molar in the mouth to destroy the second molar beyond restoration?

C. W. Coltrin. Partial Dentures and Removable Bridge Work. Table.

Demonstrating from models some practical points in partial denture and removable bridge work construction, with suggestions on the proper use of retentive appliances.

E. C. Pendleton. Pure Gold Inlays. Table.

The reproducing of wax moulds of inlays into a metal which, when cast, does not shrink to any appreciable degree, giving the operator an inlay which adapts itself perfectly to the cavity and still is of sufficient hardness to withstand the force of heavy occlusion, has been, and is, somewhat of a problem.

Pure gold when cast becomes quite soft; yet gives clearer, definite outlines than any other metal or combination of metals. An inlay cast of pure gold adapts itself to its cavity, closer than an inlay cast of any other metal, and can be condensed or tempered by malleting and burnishing so that inlays cast of pure gold will stand heavy occlusion, without wearing or flowing, to a greater degree than a filling of gold foil.

To condense an inlay cast of pure gold, first—the inlay should be practically finished, that is, the contact restored and margins burnished; then place the inlay in the cavity, having the patient close the mouth and direct the motion of the jaws as in process of mastication. In this way the points of heavy occlusion may be determined by the marks of the opposing tooth on the surface of the inlay. Remove the inlay from the cavity and invest in modeling compound, chill, and then with a finishing plugger in your engine mallet the inlay may be condensed, especially at the points indicated by markings where the heaviest occlusion occurs, without fear of distorting your inlay.

J. P. Buckley. The Prevention and Eradication of Focal Infection. Table.

This clinic emphasized the importance of so treating and caring for the teeth that *infections* about them would not ensue; and when infection was found in the mouth the clinician demonstrated methods and means of removing it and preventing its recurrence. The author's technic of resecting root-ends and curetting and treating the involved area was given in detail. Special attention was called to certain instruments designed to assist the dentist in doing this work.

Several models were shown where deep pyorrheal pockets were cured by the somewhat radical method of slitting the overlying gum tissue and keeping it packed until the edges healed and contracted, thus exposing the tooth root, which should be smoothed and polished so that the patient can readily keep the part clean. Other cases were shown where one badly involved root of an upper molar (it may be any one of the three roots) was completely excised, leaving the other two uninvolved roots to perform the function of the tooth. Attention was directed to the testing for the vitality of pulps in badly diseased pyorrheal teeth and thus eliminating the possibility of there being a dead pulp in the tooth which complicates the condition. Often a pyorrheal pocket does not respond to the treatment because of a dead pulp in the tooth. This point should not be overlooked.

By surgically eliminating deep and otherwise incurable pyorrheal pockets, by removing and treating gangrenous pulps in these badly diseased teeth, and by excising a diseased root of an upper molar where the other roots are not badly involved, many seemingly hopeless teeth may be saved and kept comfortable, healthy and useful for a number of years. The clinician made it plain, however, that these methods should not be followed unless the end sought was accomplished. The object here was to remove and prevent the subsequent occurrence of *infections* about the teeth. If this was not obtained the teeth involved, by all means, should be extracted.

WISCONSIN STATE DENTAL SOCIETY, FORTY-FIFTH ANNUAL MEETING, HELD AT OCONOMOWOC, JULY 13-15, 1915.

DISCUSSION OF DR. MOOREHEAD'S ADDRESSS ON "FOCAL INFECTION."

DR. R. J. WENKER, Milwaukee, Wis.

Mr. President, Ladies and Gentlemen:

We have indeed listened to a classical discussion of the subject of focal infection. My friend, Dr. Moorehead, is well qualified to present this subject, both by education and by opportunity. I had the pleasure of visiting the doctor some time ago and of seeing his hospital service and operative work. He devotes one-half of his time in the hospital work and is one of Drs. Billings and Rosenow collaborators, a better opportunity than which can scarcely be found anywhere. I am pleased to say that I most heartily endorse everything that the essayist has said.

The subject of focal infection is so intensely interesting and so very large that I hardly know where to begin and from what angle to discuss it.

Many general practitioners of dentistry and some of our specialists view the subject as though it were shrouded in mystery and incomprehensible, and not understanding it they antagonize it.

I have read two papers on the subject in the two previous months and among the numerous questions that were asked I will mention the following:

"An infection at the end of a root may be transferred to a toe joint, may it not? In other words it may travel from one extreme of the body to the other, may it not?"

The manner in which this question was asked suggested to me that it was not asked for information, but rather for the purpose of ridiculing the subject.

Focal infection is not an invention nor a fad. It is an old pathological manifestation which has been clinically recognized by some observers for many years, and has been scientifically demonstrated by laboratory experimentation within the past few years.

A focus of infection is simply an area of infection, more or less circumscribed, in which bacteria thrive and from which infectious and toxic material may be carried by the blood and lymph streams to other structures of the body. Or, again, a focus of infection is a distributing center for infectious and toxic material.

Perhaps it may be of interest in this connection to review a few elementary facts about the blood and its circulation.

The blood represents about 7.7 per cent of the body weight and therefore a person weighing 156 has about twelve pints of blood, this blood flows to every tissue of the body under a high pressure and velocity. The pressure ranges, in different periods of life from about 80 to 220 mm., and flows at a velocity of 320 mm. or about 12½ inches per second in the aorta. Although this high velocity is much reduced in the capillaries, nevertheless the average time necessary for the blood to make a complete circuit from the heart through the arteries, capillaries, veins and back to the point of beginning is only 23 seconds. Therefore the blood makes 3,765 complete circuits every 24 hours.

Abscesses and other areas of infection are walled off more or less perfectly to protect the surrounding healthy structures. In an abscess we have a connective tissue wall, which wall requires blood supply to nourish it and to carry away the waste resulting from its cellular metabolism. When you consider therefore that 12 pints of blood making 3,765 circuits in 24 hours, under from 80 to 220 mm. barometer pressure and the abscess wall surrounded with blood and capillaries actually penetrating into its soft and inflamed wall, is it any wonder that infectious material gets into the blood stream and is carried to and lodged in remote structures of the body?

As a matter of fact we have more manifestations of the in-invasion of the blood and lymph streams with bacteria and toxic material than is apparent to the average observer. In every one of the long list of infectious diseases bacteria and toxic material get into the blood stream. It is this bacteremia and toxemia which produces the systemic phase of the disease, namely, disturbance in temperature and pulse rate, anorexia, vomiting, languor, vertigo, prostration, etc., etc.

As a result of these infections and including the metastasis of bacteria from chronic foci, small colonies of bacteria get into the blood stream and frequently these colonies are too large to pass through small vessels and therefore block and obliterate them. Thus the nourishment to a joint or to the mucosa of the stomach, or any organ, or structure is shut off. The bacteria thus lodged may die and do no further harm than the mechanical blocking of small vessels and the poisoning of the neighboring cells by the dead bacteria. On the other hand, bacteria so lodged, may live, because of their high virulence and the low resistance of the surrounding cellular structure and thus become a new focus or distributing center.

In the course of a life time after an individual passes through all of the infectious diseases of childhood, such as scarlet fever, measles, diphtheria, whooping cough, infantile paralysis, tuberculosis, corea, influenza, tonsilitis, rheumatism, etc., including all the other infections which may occur in adult life, he has been prematurely aged in a marked degree because of the blocking off of many of the small blood vessels in all of the tissues and organs of the body, and because of the great damage that has been done to that part of the circulatory system which still remains, and also because of the great damage done to the cellular structure of every tissue of the body. Each time a highly organized tissue is injured or destroyed nature repairs this tissue with one of a lower degree of organization and therefore the reparative tissue is not capable of performing the same high class function which the original tissue performed.

Dr. F. A. Thompson gives a simple test to determine the relative degree of premature aging, as manifested by the reduced capillary circulation of the skin. Any one can readily make the test by pressing a finger tip on the skin and upon removing the finger note how long it takes for the color to return in the area pressed. By comparison the relative aging may be determined, the slower the return of color the more advanced the aging.

Dr. G. V. Black, in his publication entitled "Special Dental Pathology," reviews the subject of focal infection and writes as follows:

"Dr. Billings and his associates have found the organisms in the original focus in the mouth and tonsils, have found the same organism in inflamed joints, or other secondary lesion, have cultivated this organism, injected it into animals, produced identical lesions in the animals and finally recovered the organisms from the affected tissue of the animal. This chain of evidence establishes beyond question the relationship of the local focus and the systemic condition."

I believe that the impression prevails that focal infections are rare. Dr. Billings made the statement at the State Medical meeting, held in Oshkosh, a year ago, that the majority of the members present in the audience before him had some form of infection.

Dr. William Hunter, a surgeon of London, writes in 1911, as follows:

"In my clinical experience septic infection is without exception the most prevalent infection operating in medicine, and a most important and prevalent cause and complication of many medical diseases. Its ill effects are widespread and extend to all systems of the body. The relations between these effects and the sepsis that causes them are constantly overlooked, for the chief seat of that sepsis is the mouth, and the sepsis itself when noted, is erroneously regarded as a result of various conditions of ill health with which it is associated, not as it really is, an important cause or complication."

It must be evident to you all therefore, that focal infection is exceedingly common.

The Gross Pathology of a Chronic Alveolar Abscess.

An alveolar abscess would not be likely to develop in the apical space were it not for the primary development of a nidus for bacterial growth. This nidus is produced first by the presence of a non-functionating space in the root canal which contains dead organic material, and is in direct communication with living material, and second, by the toxic effect in the apical region from the decomposition of this organic material. Bacteria reaches this nidus either through the root canal or through the blood stream, or both. An acute inflammatory process with cellular proliferation and pus formation is soon developed.

The fibres of the peridental membrane are more or less detached from the alveolar wall on the one side, and from the root on the other. In the acute stage there may be very little destruction of the fibres of the peridental membrane and of the alveolar and bony structure, or the extent of the destruction may be very great. As the acuity of the process subsides the infected area becomes surrounded with epithelial cells from the normal epithelial cells in the peridental membrane and this is soon cornered with a connective tissue wall forming a true infectious cyst. More or less of the apical end of the root projects into this cyst and becomes pus-soaked. The majority of pus-soaked apices are more or less disintegrated and roughened while the minority become exostosed by a deposition of calcarious material upon their exposed surfaces.

Ninety-eight per cent of these alveolar abscesses if not prevented merge into a chronic stage. This stage, if not treated, may continue with or without periods of exacerbation throughout the life of the victim, with a gradual increase in the destruction of the surrounding tissues, from the pressure due to the enlargement of the cyst.

The Treatment, and What Repair May We Expect from It.

It has been abundantly demonstrated in clinical experience, that the proper treatment of these cases will induce a reparative process in the majority of cases. In the treatment of these cases it is important, first of all, to secure a good X-ray picture which will show the extent of destruction and thus enable you to deal with the pathology intelligently.

In the acute stage, in the presence of very slight destruction of tissue excellent results may be secured by establishing proper drainage and thoroughly antiseptisizing the apical area, provided cellular destruction is not induced by caustic antiseptics and bad surgery.

In the presence of more extensive destruction of tissue and especially in the chronic stage, it must be remembered that the fibres and the osteogenetic cells of the peridental membrane which has been detached from the root are destroyed and therefore incapable of forming cementum and effecting a vital reunion with the root and also that the denuded root has been pus-soaked. The detached membrane has been converted into a scar-tissue cyst lined with epithelial cells. This pus-soaked root is capable, like a pus-soaked necrotic sequestra, of continuing indefinitely to induce a purulent secretion. Antiseptic treatment may check the purulent process for a time but it will invariably return after cessation of the treatment. My authority for these statements, among many others, are notably Dr. G. V. Black and Professor Dependorf of Leipzig.

The course of treatment in these cases is therefore very evident, namely, the root resection with curettement or extraction and curettement of the cyst, according to the extent of destruction. If root resection is the chosen method in a given case, I urge most strongly that the old root filling be removed and the canal be retreated, and refilled, prior to resection. This method of treatment is indicated in cases where the destruction is well circumscribed around the apical third of the root, in fairly well nourished individuals, with slight or no systemic disturbance.

In all other cases extraction and curettement are indicated. The nature of the healing which will take place over the resected root provided the infection and its cause are eradicated, is the formation of a connective tissue capsule over the root, which capsule makes a mechanical contact with the resected surface. It is evident that this surface should be made as smooth as possible to prevent subsequent mechanical irritation.

My reasons for advocating curettement of the cystic areas in these cases are these: I have found from experience that if the teeth are extracted without curettement many of them refuse to heal perfectly and require subsequent curettement. This appears to be true, especially in patients suffering with systemic disturbances from these foci, and in all those having poor nourishment. In addition to this it certainly is not good surgery to allow an infected cyst to remain and especially to allow the gum tissue to close over an infected area without packing the socket to prevent its rapid closure.

Not being able to find suitable curettes in the market which may be used to curette sockets in the posterior part of the mouth, I have constructed a pair of long, large contra-angled spoons for this purpose. (Illustrated by showing instruments).

I could cite many clinical cases to illustrate the various types of focal infection with which we come in daily contact but I will not take the time as there are two other phases of this subject which I wish to touch upon before closing.

Focal infection is the result of mistakes of the past, and each member of this audience has some such cases among his patients. I say this because the evidence of the X-ray and of clinical experience demonstrates beyond a doubt that all classes of practitioners, good, bad and indifferent, have inserted imperfect root canal fillings. Now a question of great importance to each one of you is this: what are you going to do with all of your previous root canal fillings? Are you going to close your eyes to all of them in the hope that they are all perfect and wait for your medical brother to make a diagnosis of alveolar focal infection and order the extraction of some of your highly prized crown and bridge work, and thus lose some of your very best patients? Or are you going to take the initiative and clean up all possible avenues of danger before this happens? I strongly urge that you do the latter, and thus retain your desirable patronage. The embarrassment of facing your own mistakes is not nearly so bad as the embarrassment which will result when others discover and uncover them.

In order to carry this plan out thoroughly every previous patient whom you can reach you should make a very critical examination of every tooth which you know, or suspect is pulpless, by means of the X-ray, and the remainder of the teeth should be carefully tested with the Faradic or High frequency current, to determine whether or not they are vital. Then make a complete record of the conditions found and deal with them accordingly.

The other phase of this question which I wish to refer to is, what are you going to do to prevent a repetition of these mistakes? I will append a brief summary in answer to this question.

First: Never devitalize a healthy pulp for any purpose.

Second: When devitalization is necessary or occurs spontaneously, use the most rigid aseptic precautions to prevent infection from entering the canal. To do this successfully requires the most careful surgical technic. The rubber dam should always be applied, and the hands of the operator, the field of operation and all of the instruments and material used in the treatment should be thoroughly sterilized.

Third: When the end of the canal has been apparently reached a broach should be inserted the full depth of that portion of the canal opened, and the same should be carefully X-rayed to note whether or not the apex has been reached, if not, this process should be repeated until it has been well opened and enlarged, sufficiently to enable proper filling to the apex.

Fourth: When the pulp has died spontaneously the tooth should be X-rayed to determine the condition in the apical region.

Fifth: In treating these cases in addition to the usual caution in entering the canals, the same rigid aseptic technic is required as in other canal work. When apical destruction of tissue exists they should be dealt with as previously described.

Sixth: Oral Prophylactic teachers and the dental profession generally, should get busy with prophylactic work.

Ninety-five per cent of adults have some degree of alveolar infection, which, if checked in the early stages, will prevent the development of a more or less incurable stage of so-called pyorrhea which is also a marked source of focal infection.

CLINICS.

DR. ALOLPH GROPPER, DIRECTOR OF CLINICS.

CHAIR CLINIC.

Gold Foil Filling, Restoration of Marginal Bridges.

DR. W. R. CLACK, Mason City, Iowa.

Patient, Dr. Rodulf, of Madison, Wis. Cavity, mesio-occlusal surface of upper left, first bicuspid, no separation, the cuspid had telescoped into the cavity, somewhat. The lingual cusp, was weak, so it was shortened and restored with gold.

The regulation "Black" preparation was made, and one and one-quarter sheets of unannealed gold was placed in the gingival third of the cavity, and annealed gold was used for the rest. The marginal ridges and the triangular ridges of the buccal and lingual cusps were restored. Separation was gained by wedging of gold against the distal surface of the cuspid.

The gold was condensed by hand pressure supplemented by hand mallet used by the assistant.

In all five and one-half sheets of gold were used.

Porcelain Jacket Crown.

Dr. Harry B. Child, Minneapolis, Minn.

This clinic was the placing of a poreclain jacket crown upon a right lateral incisor by the indirect method of obtaining an impression of the trimmed root, making a cement model upon which to fashion the matrix, placing this cement model within a plaster model of the surrounding and occluding teeth, and after shaping the matrix to the cement model, building up the porcelain body upon this.

The interesting features I wish to bring out were:

1st. The use of a smooth-sided end-cutting bur for trimming the root at the gingival; also the use of Miller carbo-points in trimming.

2nd. Fitting an individual gold band around the trimmed tooth in which to place the compound for the compression of the tooth.

3rd. Bending a cylinder of .001 platinum about the cement tooth and holding with a stove-pipe joint, then teasing and burnishing to a close adaptation.

4th. Mixing the porcelain body with a solution of gum tragacanth in water, which lends adhesion enough to make it possible to handle the forming tooth much as clay could be handled and with much freedom in shaping and carving.

Exhibiting Cases of Cleft Palate Hard Rubber Obturators.

Dr. L. A. Meyer, Oconomowoc, Wis.

Case No. 1. Miss B. Age 42. Exhibition of models showing extent of cleft involving pre-maxillary fissure in hard palate one-half to three-fourths inch wide, also fissure of soft palate, three-fourths to one and one-half inch wide.

Case corrected by first raising bite, by crowning and bridging lower teeth, also uppers, thereby obtaining a good occlusion. Models showing before correction of articulation the upper teeth to bite inside the lowers. After correction the case presented a quite normal occlusion. Construction of combination rubber and gold plate with tube attachment to fit crowns, also spur of gold wire upon which to build hard rubber obturator. Building up in vulcanite work and inserting two centrals and left lateral to make up tissue loss. Now then having case restored with the missing teeth upon the gold plate which also is to serve for carrying of hard rubber obturators. Proceeded to mould warmed beeswax upon the spur of wire on plate to carry obturator and insert this while warm in the mouth of the patient, requesting patient to swallow and talk. Chill wax with cool water, remove and note impression thereon, using this as a guide in restoring or making the obturator. This act of moulding the wax must be repeatedly tried in the mouth of the patient or until satisfied that you have obtained a good closure in swallowing acts with the remaining soft tissue about the obturator. Reproduce in vulcanite on spur of gold plate and finish with high polish of parts.

This case has been worn over three years with comfort and no irritation to tissue. Patient present answered several questions to pronounce difficult words and did so with apparent ease. Also demonstrated the swallowing act to be quite perfect.

Case 2. Mrs. M. Age 25. Models as in Case No. 1. Some variation in cleft. Corrected case by all vulcanite work. Patient not present. The case has been worn for five years with perfect comfort.

Conductive Anesthesia, Fischer Method.

Dr. P. B. Wright, Dr. R. J. Wenker, Milwaukee, Wis.

In conductive and infiltration anesthesia the important elements for consideration are (in addition to the proper equipment of instruments and materials, as well as the correct preparation of the materials.)

1st. A good working knowledge of the anatomy.
2nd. Sterilization of the proposed field of operation.
3rd. Technic of injecting the anesthetic.

Element No. 1 is familiar to every practitioner.

Element No. 2.

Sterilization of Proposed Field of Operation.

1st. Rinse mouth freely with solution of one-third dioxogen and two-thirds sterilized water.

2nd. Swab freely, area of proposed operation and vicinity with pure three per cent dioxogen.

3rd. Swab similar area freely with pure tincture iodin.

4th. Press small pellet of cotton saturated with tr. aconite on area in which first insertion of needle is to be made.

Element No. 3.

Technic of Injecting the Anesthetic.

(*a*) *Areas to inject to induce conductive anesthesia.*

Maxillae 1st. Around the infraorbital foramen.
2nd. Around the posterior maxillary foraminae.
3rd. Around the posterior palatine foraminae.
4th. Apical regions on buccal and labial sides.

Mandible 1st. Around mandibular foramen above the lingual.
2nd. Around the mental foramen.

(*b*) *Areas to inject to induce infiltration anesthesia.*

Maxillae and mandible in papillae and marginal gingivae of any of the teeth.

(*c*) *Method of injecting.*

1st. Pass needle through flame.

2nd. Draw up sterilized anesthetic and force out air from syringe.

3rd. Hold barrel of syringe like pen when inserting needle into tissue.

4th. Beveled edge of needle should face toward hard tissues when inserted.

5th. Use index finger of opposite hand as guide in placing needle for injecting around foramina.

Mandibular injection was demonstrated in a practical case from which an ossifying fibroma (microscopic diagnosis) the size of a hickory nut was excised from the lingual aspect of the mandibular ridge without the slightest pain to the patient, as per her own statement.

Post operative treatment was ordered.

Porcelain restoration. One-third of incisal of two central incisors.

Dr. W. T. Reeves, Chicago, Ill.

Surgical Removal of Impacted Teeth Under Nitrous Oxid and Oxygen Anesthesia.

DR. G. B. WINTER, St. Louis, Mo., assisted by Dr. R. S. Hopkinson as Anesthetist.

The technique of removing partial impacted lower third molar was demonstrated, showing the proper application of the elevator and extraction movements so as to deliver the tooth from the socket without causing a fracture thereof, or causing any disurbance to the second molar or supporting structures. The removal of roots of teeth was demonstrated giving special attention to the lower first and second molar, showing improved technique of removing roots of this character without causing any material trauma. The technique of removing badly broken lower first and second bicuspids by means of elevators was also shown. Removal of the upper first bicuspids was also demonstrated showing procedure whereby these roots can be removed without causing a fracture.

Outline.

F. B. MOORHEAD, Chicago, Ill.

1. Metastatic focal infection established.

2. Focal localities. *a* Pelvis, *b* Appendix, *c* Gall Bladder, *d* Jaws and Teeth, Nose and Sinuses, Head, Tonsil.

3. Complexity of tissues. Makes for danger and chronicity of focal jaw infections.

4. Mutability of bacteria. Streptopneumococcus group.

5. Two local types. *a* Pyorrhea, *b* Chronic abscesses and cysts.

Relation of poor dentistry to both. *a* Mechanical irritants in relation to pyorrhea (the new dentistry also mechanical.) *b* Faulty root canal technique, diagnosis; X-ray should become a routine procedure in general practice. *a* General survey of every mouth. *b* Confirmation of root-canal fillings (permanent record). *c* Films at intervals to watch report in cases of rarefactions, etc.

Interpretation of films and plates. *a* Relation of rays to root. Elongated root appears imperfect. *b* Shortened root appears perfect. *c* Diseased areas on opposite side of root. *d* Multi-rooted teeth deceptive. Two canals in bicuspids and mesial canals in molars.

Relative density of bone in field to be observed in determining rarefaction. Outline of infective granuloma may be obscure.

Pyorrhea: Prognosis only by X-ray information. Destruction of cementoblasts always a determining factor. Question of reattachment of fibres paramount.

To what extent is tooth safe when fibres are not reattached? Re-infection the rule. Danger of reinfection obvious.

Chronic Abscess: Gravity of chronic abscess not related to subjective symptoms. Presence or absence of fistulaes unimportant. Peridental membrane the crux. Roughened apex, bone, cavity, etc. Both pyorrhea pocket and chronic abscess, focal infections.

Treatment: What teeth shall be extracted? *a* Pyorrhea. Two Questions.

1. Extent of destruction of membrane. 2. General health of patient. How far shall one presume on good health. Mutli-rooted teeth. Single-rooted teeth.

b. Chronic abscess. Peridental membrane a determining factor.

Extract 1. Molars and lower bicuspids in cases of general infections, which are seriously involved. 2. Teeth in-which root canals cannot be successfully disinfected and filled. All teeth treated must be observed at regular intervals by X-rays.

Combination treatment: Root-canal plus resection.

Inspection of tissues of greatest importance.

All inflammatory tissues must be removed (leave none.)

Danger of depending upon root canal medication where granuloma exists.

Removal of infection the first greatest duty.

Technique of Building Porcelain Jacket Crown. Practical Case.

Dr. H. M. Uebele, Milwaukee, Wis.

Prepare root. Remove enamel on labial and lingual side with a stone, and the mesial and distal with separating disks. Next remove occlusal third of tooth. Take wire measurement and make a copper cope. Then cut a square shoulder on root, just under the free margin of gum. Take impression of tooth with modelling compound in cope; also take bite in wax, and take shade. Run out impression in cope with cement. When hard remove and place same into bite, and run out bite with plaster. When hard separate. Burnish platinum over cement root, and bake crown over same. Remove platinum and set with cement.

The Making of a Perfect Fitting Gold Inlay.

Dr. J. V. Conzett.

There is nothing absolute in this world so that the title must be understood to be relative, but the idea is to make an inlay that will so perfectly fit the cavity that to all intents it is perfect.

The method demonstrated consists of the proper cavity preparation, the proper wax and manipulation thereof and the proper investment, burning out and casting. In the cavity preparation we follow the lines laid out by Dr. G. V. Black insofar as they can be followed in the making of an inlay and only deviate to the extent necessary to meet the exigencies of the case. We insist on the carrying of all lines into the area of the least susceptibility to decay following the doctrine of extension for prevention. We demand a sufficient resistance and retentive form and we believe that both of these forms are best obtained by the making of the cavity as nearly box shaped as it is possible to do, that is we insist upon flat seats and parallel walls. We also advocate the beveling of the cavo-surface angle all around the margins of the cavity.

The flat seat is the best form that we can give a cavity to resist the thrust forces that the filling will have to resist and the parallel walls and sufficient depth of cavity is the best form to give a cavity to resist the pull forces that will test the inlay. In proportion to our departure from the parallel wall form of preparation in our cavities that are to receive an inlay, will we invite failure by reason of the inlay falling out of the cavity, for the cement will not be sufficient to retain the inlay against the stress of mastication unless it is aided by a sufficient mechanical form in the making of the cavity.

All of the lines of the preparation of the cavity should flow into the same, that is there should be no flat seats, aside from the gingival seat and occlusal step, upon which the finished inlay might ride and prevent its perfect seating in the cavity. We do this in order to compensate for shrinkage, which we will explain later.

The cevo-surface angle is generously beveled all around and the bevel is greater than that usually given for a filling, for the reason that we desire to have a sufficient flange cast upon the inlay to burnish to perfect adaptation.

We use the bevel for the purpose of protecting the enamel margins and cutting off all short rods, and that a flange may be cast on the inlay as has been said for the purpose of burnishing to immediate contact with the tooth immediately after cementation and before the cement has begun to crystalize, also for the purpose of best protecting the cement from breaking up under the blows of masticatory stress and washing out from under the inlay.

The wax used is one that is hard at mouth temperatures, for we do not chill the wax after insertion because cooling causes the wax to shrink and will to that extent cause a discrepancy in the inlay. All of the different processes of the making of the inlay should be carried out as nearly at the same temperature as possible. Open mouth temperature is only slightly above room temperature and if all of the processes are carried out in room temperatures there will be very slight errors due to change of temperature and shrinkage or expansion due to changes thereof.

The wax should be forced into the cavity and pressed into the same from all directions and pressure maintained until the wax is hard and all of the shrinkage of the wax in cooling, may be taken up by other portions of wax being forced in to take the place of the shrinkage.

Price has demonstrated that wax is elastic and as it is in an abnormal condition when pressed into the cavity by reason of the stress placed upon its molecules during the insertion of the wax, it will tend to return to its natural condition when the stress is taken away and we will have a distortion of the model by reason of the elasticity of the wax. We therefore release the elasticity of the wax while it is still in the cavity. We do this by reheating the wax. This is done by throwing a continuous stream of warm water upon the wax until it is thoroughly warm and then to be sure that we have entirely released the elasticity we carve the model to form with warm instruments. The contour of the teeth is carefully reproduced and the interproximal space provided for by the assurance of a perfect contact point. The occlusal surface is carved to anatomical perfection for the purpose of restoring the function of the tooth and we assure ourselves that there will be no gingival overhang to irritate the septal tissue.

The model is now removed from the cavity and with a sharp lancet a shaving is taken from the pulpal wall of the wax. This is for the purpose of compensating for shrinkage, for no matter how carefully we have carried out all of the other processes we will still have the shrinkage of the gold to contend with, and no manner of casting will overcome this, for it is inherent in the material itself. We explained that all of the lines of the cavity were made so that they flowed into the cavity, now as we relieve the wax on the under surface where it comes in contact with the occlusal step we will have a slight discrepancy there that will allow the inlay to seat in the cavity the distance of the shrinkage of the gold and we will have a perfect adaptation at the gingival margin.

The wax is now ready for investment and should be invested in an investment at room temperature. The water should not be hot or cold but luke warm. The model should be washed off with soap and water or a little alcohol before investing or the plaster will not perfectly adhere to it by reason of the mucus adhering to the model, the investing material should be carefully painted on the model, all air bubbles eliminated and the investing completed.

The burning out should be carefully done, and the flask not overheated, it is only necessary to burn out the wax and not to burn the investment to death.

Then cast cold, allow the flask to cool off so that it may be handled with the bare fingers, the heating to melt the gold will sufficiently heat the flask and investment to compensate for temperature changes.

If all of the processes have been carried out as outlined the inlay when malleted into the cavity will have margins so closely adapted to the walls of the cavity that they will defy detection to the naked eye.

TABLE CLINIC.

Pyorrhea and the Emetin Treatment.

Dr. Kent T. Wood, Madison, Wis.

Showed the emetin preparation, syringes used, cleansing and preparation of the mouth, and demonstrated the local application and hypodermic administration of emetin.

Exhibit of Improved Orthodontia Appliance, Free from Bands, Threads, Nuts and Ligatures.

Dr. R. J. Wenker, Milwaukee, Wis.:

Appliance exhibited was made of 18 G. noncorrosible round wire looped around the bicuspids and molars in such a manner that a single wire rested upon the buccal and lingual surfaces running along the gum festoon and crossing over from buccal to lingual with a single wire resting between and upon the marginal ridges thus forming a wire basket. Extensions were made from these baskets to the anterior teeth to rotate and reflect their inclination as may be required. There was also an arm extending across the roof of the mouth connecting one basket to the other. This wire was 14 gauge and was curved to correspond to the curvature of the dome. This dome wire was attached to the baskets at a point between the second bicuspid and first molar and served as a means of expanding the arch. All soldering was done with ordinary silver solder. The wire softens considerable from the heating in soldering but by burnishing and bending necessary in the regulation of teeth it soon acquires a springy quality amply stiff for regulating purposes.

The appliance may be modified from time to time, using a recording chart as a guide. Chart may be divided into minute squares over entire surface. By placing the appliance upon this chart and marking its width at numerous points by means of pins or marks and recording the date of each change a record may be kept of the amount of modification made in the appliance from one sitting to another.

The appliance is intended to regulate the large class of moderate degrees of irregularity and also for retaining purposes. It is to be removed during eating and thus the appliance and teeth may be thoroughly and frequently cleaned and decay and gum irritation entirely prevented.

A Detail in Gold Shell Crown Construction.

Dr. C. E. Bottomley, Burlington, Wis.:

In making a gold shell crown with cast cusp, when ready to form cusp model, flow wax or fluxed wax for about 1/16 inch on both inside and outside of occlusal end of band, featheredging toward gingival, then make cusp model and when cast the cusp will fuse better with the band, also the slight excess outside permits a nicer finish, and the reinforcing on inside makes it possible to finish to better form without danger of polishing through.

Something Practical on the Bite Question.

Dr. A. B. Crawford, Edgar, Wis.:

In taking the wax bite for a partial case, place a piece of china silk between two plates of wax and take the bite with the silk so placed. After wax is hard enough to safely remove from the mouth one will find that enough wax has been incorporated with the silk so that the cusps of all teeth are clearly shown and when one runs plaster into the bite side it will not run through to the side in which the cast is to be placed and all teeth will be correctly adjusted before vulcanizing so that no grinding is required on the teeth when adjusting the plate finally.

In using the side cup to take the impression at the same time as the bite, either in wax or compound, use the same principle whether for a crown or small size bridge.

CHICAGO DENTAL SOCIETY.

A regular meeting was held Tuesday evening, October 19, 1915, with the president, Dr. F. B. Moorehead, in the chair.

Dr. J. R. Callahan, of Cincinnati, read a paper on "Root Canal Preparation."

The reading of the paper was accompanied by the exhibition of stereopticon slides.

Discussion.

Dr. E. J. Eisen, Milwaukee:

Mr. President and Members of the Society: Unfortunately, when I was asked to discuss this paper, I did not know what the subject was. I was told that it was in the *Items*. Unfortunately again, there are two papers by Dr. Callahan in the *Items*, and again, unfortunately, I picked out the wrong one.

It is indeed a great pleasure to discuss the address of a man who can speak so softly upon such a tempestuous subject.

The method which Dr. Callahan has evolved through much thought, study and experimentation, gives us in many respects and under certain conditions an ideal root filling. We are compelled, however, to select root canal fillings for each individual case as best meeting the conditions present.

A short time ago one of your members came to Milwaukee to solve a doubt in his mind as to how it were possible for a man to undertake the many things which I am trying to do and still have time to follow the technique of Dr. Callahan and Dr. Best. My explanation was very simple and can be expressed in but a few words, namely: That I do not fill as many root canals as one would imagine. The number of failures in root canal work and the many subsequently diseased teeth has made it imperative that the first rule should be: Only single rooted teeth which are apically healthy or those which can conveniently have a resection done, should be considered as material for saving. Multirooted teeth which show apical disease prior to root canal filling, should be disqualified. Making this the basis upon which we form our judgment, you may readily see that it is not necessary to work nights in order to accomplish our work.

Our judgment in this respect has been acquired by the large number of Roentgenological examinations made, and the probability of root canal filling failures in certain types of cases.

Root canal filling adherents are divided into three classes. First: Those who believe that medicaments and mechanical technique are sufficient to inhibit infection. Secondly: Those who believe that a sterile canal and sterile material are sufficient. Third: Those who believe in asepsis plus permanent asepsis.

The first class we can dismiss without consideration. In the second class we must include those who follow Dr. Callahan's method without alteration. Asepsis applied to a tooth under the rubber dam is as surely possible, in a way, as asepsis in general surgery. The only difference is this; that a root canal filling is placed in a tissue which if infected, has no means of its own or through the circulation of combating infection. The tooth is not analogous to any other tissue in the body, in that without its pulp, and even with its pulp it probably has no lymphoid tissue for protection.

Under these conditions, unless we can prove asepsis positively before each operation, we must fall back upon the principle that in order for any material to remain sterile in the mouth, that material must contain a non-irritating but positive germicide.

In many cases, in fact most cases, Dr. Callahan's method is ideal, except that no provision is made to keep the material permanently aseptic. No one could fail to be impressed, in the preoperative X-ray examination of teeth with root fillings, with the almost unexceptional healthy appearance of those teeth properly filled with oxychlorid of zinc.

The following table shows the X-ray findings in 1,000 roots of devitalized teeth.

The plates and films were examined in regular order from our files, and show the work of a large number of men, and may be regarded as fairly representing the average of root canal work at the present time.

	Per cent.
Good root fillings (to apical foramen)	13
Fair root fillings (not absolutely to apex, but satisfactory considering size, shape, and comparative inaccessibility of the canals.)	5
Imperfect root fillings	76.7
No root fillings	5.3
Abnormal apical conditions	32.4
Abnormal apical conditions where root canals were completely filled	.3

An analysis of these data presents some very interesting possibilities. From these, and the experience which we are gaining by our Roentgenological examinations, I am inclined to believe that the vast majority of apically diseased teeth as demonstrable with the X-ray, were diseased prior to the insertion of the root canal filling. That is to say: Teeth with dying pulps, and putrescent pulps, have probably infected the peridental membrane to such an extent that medication within the canal is already hopelessly inefficient. All symptoms may subside and still without subsequent resection, such a tooth will probably become a menace.

With one phase of the subject I have a pretty clear idea of the demands of the future. Namely: That we must confine ourselves to those methods and the use of those materials which are discernible in Roentgenograms, thereby making it possible for us to know how much of the root canal is actually filled.

Dr. Callahan's method gives a very satisfactory result in this respect. In cases with large foramina, it is probably the ideal filling. Where resections are held probable it is also indicated.

In very small canals in molars and bicuspids and those teeth for one reason or other difficult of access, I prefer oxychlorid of zinc.

Teeth upon which we decide to do resections are first filled, as best suits our convenience and judgment, and at the completion of the resection, Dr. Ivy applies a thin layer of black copper cement over the freshly cut surface, expecting in this way to close both the cut tubuli and possibly unfilled foramen.

In the preparation of root canals, I think the most important feature, and that which will simplify our entire attitude, will be to find out which teeth are diseased and hopelessly so before any root filling is attempted. In making a thorough X-ray examination you detect teeth which are hopelessly diseased, but which give no clinical symptoms whatever. It is valuable and in fact absolutely essential to determine the extent to which infection has progressed and the probability of successfully treating those through the root canals.

DR. JOHN P. BUCKLEY:

Mr. Chairman, Ladies and Gentlemen. I am not going to use all the bottles and test tubes which I have brought along (referring to a number of bottles and test tubes on the table before him) for the reason that I find myself somewhat in the same position as Dr. Eisen. I had hoped that Dr. Callahan, after he thoroughly and honestly prepared this root canal for filling, would fill the canal thus prepared with his resinous preparation; and some time when Dr. Callahan and myself can get together as we hope to in the not very distant future, we want to discuss the subject of root canal filling material. And that is the reason I have some of my bottles here tonight which I will not use, although I will use others.

I want to follow as near as I can the description which Dr. Callahan has given in his characteristic manner of the preparation of a canal for the root canal filling. Dr. Callahan, you remember, took a tooth in which he had devitalized the pulp. (Referring to a blackboard illustration) I believe the best way—while we are not discussing treatment tonight—that you can dispose of pulp tissue that is to be gotten rid of, I mean live pulp tissue, is by the old method of devitalizing that tissue and subsequently removing it. By that I do not mean that I do not use pressure anesthesia, for I do, but if you were to remove a pulp from one of my teeth, every one of which I am pleased to say is vital tonight, I would insist on the operator devitalizing the pulp tissue by means of arsenic. But I would not want him to leave that arsenic preparation in the tooth long enough to produce the effect which Dr. Callahan has so beautifully thrown upon the screen. So I would apply to this live pulp tissue my arsenical preparation, and I will leave it in the tooth only long enough to poison the tissue but not to completely devitalize it; but the dentin is devitalized, through which I can subsequently painlessly drill and expose liberally, with a small amount of pain, the poisoned pulp tissue. After that tissue is poisoned, then I want to complete the devitalization by some remedy which contains formaldehyde, my old friend and stand-by. Notwithstanding the fact that Dr. G. V. Black in that most excellent book—that book which every dentist should have and should not only have but study—notwithstanding the fact that he has made the statement that no remedy which is as destructive to soft tissue as is formaldehyde or a combination of formalin and cresol should ever be sealed in a tooth; the statement was based on the fact that formalin and cresol, sealed on to the arm destroyed the vitality of the tissues within a given area. If Dr. Black had sealed on to the arm an ordinary devitalizing paste, he might as well have made the statement that no preparation which contains arsenic should ever be sealed in a tooth. I want you to use arsenic if you are going to follow the ideals which I am going to present here tonight, but use it only to the degree of poisoning the pulp, and in no sense to completely devitalize it, and subsequently complete the devitalization by some remedy like formocresol. I don't care what you use, as long as formaldehyde is a constituent of that remedy.

Now we have our pulp tissue poisoned, and the devitalization completed by formocresol. We are ready to remove the pulp as Dr. Callahan has indicated. We can readily remove the pulp in the distal root of a lower molar or the lingual root of an upper molar—I will go farther than that and say that in almost every case, with the skill that a dentist of today should have, he can remove by the technic given by Dr. Callahan, the pulp tissue in the mesial canals of lower molars, and pulp tissue in the buccal canals of upper molars. If we do more than simply make a jab with our large broach here and there, where we think the canal ought to be and because we do not hit the mouth of the canal, by our jabbing process, make up our minds that this is one of those fine and tortuous root canals which some one has said are so fine and tortuous and contain so small an amount of organic material that we do not need to worry about it. I say, if we open this pulp chamber by the means which Dr. Callahan has given—I like to use a bur on this, and for my students to use in the school, I took an ordinary inlay bur, but a good sized one, and modified it only to the extent that I made this edge round (indicating by means of blackboard illustration). With that pulp chamber bur I can open liberally into the pulp chamber, so that I can get direct access to those canals.

Having disposed of this tissue in the large canal, with your twist broach or your barb broach, you cannot fail to get down into that canal; then saturate it with oil of cloves, as Dr. Callahan did, or you can stop up the mouth of that canal in a manner you see fit. Then if it is a lower tooth I like to flood the entire pulp chamber with that remedy which one of my friends and well wishers, (addressing the reporter, Mr. Stenographer, get this right) Dr. Hermann Prinz of Philadelphia has said is a remedy which is absolutely worthless. Having performed a long series of investigations, that scientific gentleman has come to the conclusion that phenolsulphonic acid has absolutely no therapeutic effect. I am surprised at the picture thrown on the screen by Dr. Callahan where he has endeavored to remove tissue from the canals of teeth, after the method of Hermann Prinz, where the latter advised the use of nitrohydrochloric acid. If Dr. Hermann Prinz's knowledge of chemistry is so profound as he would lead us to believe it is, he ought to know that all you get from nitrohydrochloric acid, is chlorin gas, and chlorin gas will not disorganize anything in the sense that Dr. Callahan's sulphuric acid, followed by sodium bicarbonate solution will do. So I flood this pulp chamber with phenolsulphonic acid. There are three kinds of phenol sulphonic acid. There is that which was suggested by the late Dr. Cook, where you take equal parts of crude sulphuric acid and crude phenol and mix them together, and you have Dr. Cook's so-called phenolsulphonic acid. Dr. MaWhinney suggests that you take phenol and sulphuric acid, only chemically pure, in equal parts and heat the phenol nearly to the boiling point, and gradually but cautiously add the sulphuric acid, and you will get phenolsulphonic acid. If the doctor had taken the precaution or the pains to have had that product analyzed he would have found that there was 15 per cent. of uncombined sulphuric acid in his so-called phenolsulphonic acid product. If you take 95 parts by weight of pure sulphuric acid and 93 parts by weight of the crystals of phenol, either the synthetic phenol or the ordinary phenol, and will heat those two agents in that proportion to 100 degrees C., and keep that temperature for a period of 20 hours, you will force the phenol to be combined chemically with the sulphuric acid, and you will have less than 3 per cent. of uncombined sulphuric acid. And that is the product I use.

I am particular in giving you the exact proportions of the ingredients I mentioned, because I have been accused in a roundabout way by my friend and well wisher recently of not publishing my formulae. It is just a little late for Dr. Hermann Prinz to accuse me of not publishing my formulae. I never mentioned a formula but what the formula was published and but what my profession could get for the mere asking.

The phenolsulphonic acid is there in that canal. Don't go down into that canal with a broach that you know before you start would not go anywhere near the end, but take a fine twist broach. You know what I mean; the finer the better. Do not try to remove that pulp tissue with a barb broach, but with this fine twist broach, started in the mouth of that canal which you suspect is going to be fine and tortuous, and carefully twist it, and you will twist it through the root canal, and as you twist it you will work along down in that canal your phenolsulphonic acid. If it is an upper tooth where you cannot flood the pulp chamber with the phenolsulphonic you can dip the broach in the acid and work it into the canal. The phenolsulphonic acid has one property, an advantage which Dr. Callahan's thirty per cent. sulphuric acid does not have, in that it has a syrupy consistence and will not materially affect the broach, and you do not need to be afraid of the broach being so affected by the acid which you are using that you are liable to break the broach because of its being weakened by the acid. If it breaks it breaks for some other reason than because it has been acted on by the acid.

Now you work that phenolsulphonic acid and that broach down into that canal, and if you start with a small twist broach, not a large one that packs that pulp tissue down into the canal—if you do not pack it down into the canal you will be surprised to find that you have fairly respectable canal in these mesial roots of those lower molars, where you have been leading yourself blindly to believe that they were fine and tortuous, and you could not get anywhere near the end. After you remove the pulp in this manner, you take out the packing in the distal canal and let the phenolsulphuric work down there, and you can take a good sized barb broach—and where Dr. Callahan uses the sulphuric acid I use the phenolsulphonic, and after you have worked that a while—you thought when you first removed the pulp which you got out in one piece that you had it all out, but you forgot as Dr. Callahan has emphasized—you thought you removed that odontoblastic layer of cells or the dentinal processes of the odontoblastic cells which go into the open tubuli. Now we work that remedy down, and you will be surprised after a time what a mushy—I don't know of any other way in which to describe it—substance you will find by having worked your phenolsulphonic acid down in that canal, which you thought previously was fairly clean.

Now we are going to take Dr. Callahan's sodium bicarbonate. I like to follow a man like Dr. Callahan, because he does not give us any fine spun theories. He tells us just what he does at the chair, and whatever he tells us you can bank on it and know that he does do it. We have here some phenolsulphonic acid, only it is thick and syrupy you will notice. (Produces a sample of the acid.) Dr. Callahan's sulphuric acid would act the same. I will dilute it a little. (Diluting it.) This phenolsulphonic acid gets down into that canal. Now you will see, illustrated in a test tube, exactly what Dr. Callahan showed you in the pictures. We neutralize the acid which has not already been neutralized, with sodium bicarbonate solution.

You can get Dr. Callahan's idea. You can see what Dr. Callahan meant, and that is absolutely right.

There is no danger of the force of the reaction going the wrong way. That is what you meant, is it not, Dr. Callahan?

DR. CALLAHAN: Yes.

DR. BUCKLEY: Downward in the upper, and upward in the lower.

If any of you gentlemen will take a canal from which you have removed the pulps, and treated it in a gangrenous case, I do not care how you have treated the canal, if you will take that canal where heretofore you have felt satisfied that it was in that condition which would justify you to fill it, if you will work the phenolsulphonic into that canal with a barb broach, you will be surprised, and you will not believe the amount of mushy material which in two or three minutes' time you will get in that canal which you had, before you used the chemical, thought was fairly clean.

I like to use chemicals, but I want to know what I am using. I know Dr. Callahan gets the results which he says he gets. He is a practical dentist not a theoretical experimentor. He makes his livelihood standing at the chair, and every time he makes a statement he has that statement backed up by his practical clinical experience.

Let us take Schreir's potassium and sodium—and I read with a great deal of pleasure the statement in our announcement that wherever good root canal work was known the name of Callahan was known. I want to say too for the benefit of a friend of mine who has been asking me to use certain chemicals for years, and I have hesitated because I felt that it was not quite the thing that I ought to use—I want to say that wherever good root canal work is known the name of Dr. M. L. Rhein of New York is known. I do not know of any two men as different in their make-up, differing in their personalities, nevertheless, I do not know of any two men who are more honest and conscientious and who believe in the statements which they make more fully than Dr. Callahan of Cincinnati and Dr. M. L. Rhein of New York City.

Dr. Rhein of New York City uses sodium potassium. If you take metallic sodium and put it on water the sodium will decompose the water violently, and caustic soda will be produced, and as a bi-product also from the decomposition of the water you will get hydrogen gas liberated. While the metallic sodium will decompose the water it does not do it with that violence and it will not generate a sufficient amount of heat to cause the hydrogen to burn. (Illustrating by means of a chemical experiment.) You see how it bubbles, but there is no flame or pyrotechnic display there. I have here a small piece of potassium, and you find that it will do the same. Not sodium and potassium, but metallic sodium in one instance, and metallic potassium in the other. You will find that the metallic potassium will do the same thing in the water, but it decomposes the water with such violence, you will have such an amount of heat generated by the decomposition of the water that the hydrogen which is liberated from the water will burn.

(The speaker illustrated by means of a chemical experiment in which the liberated hydrogen burned above the surface of the water.) Now let us take Schreier's mixture of potassium and sodium—I do not know that Schreier ever told us the exact proportion.

But I have here a sample of equal parts of metallic sodium and metallic potassium. It makes an alloy, and you will see what takes place when Schreier's paste is put into a canal which contains moisture. This is the most important subject before the dental profession today, and it is up to us to show the medical profession whether we have to extract all the teeth that Dr. Eisen says we have to or whether some of those teeth can be saved and put in proper condition. So I say, this sodium potassium when placed in a moist canal, has as a bi-product caustic sodium and caustic potassium, or potassium hydroxid and sodium hydroxid, and it is these alkalies, these soluble bases, that decompose or disorganize the remaining pulp tissue in that canal and cause this soap-like or gelatinous-like mass which Dr. Callahan does not like, and which he has to get rid of by the final use of his sulphuric acid and sodium bicarbonate.

I have made several samples of sodium and potassium. The preparations must be kept under hydrocarbon oil. I have one specimen of one part sodium and one part potassium, and one specimen of one part sodium and two parts potassium, and one specimen of two parts potassium and one of sodium. If I were compelled to use any one of those three alloys of the sodium and potassium I would prefer by all means the one containing two parts of sodium to one part of potassium. But I can do better than that. I can take in a mortar under a hydrocarbon oil like kerosene, xylol or xylene which Dr. Best uses to disorganize the gutta percha in removing root canal fillings, which is good for that purpose—any hydrocarbon oil, and I can macerate or incorporate with the sodium one part of potassium to about nine parts of sodium—you could not use sodium alone, it is too waxy-like—you cannot use the potassium alone because it is too stiff also, and you cannot get your broach through, and yet it is softer than the sodium—I would prefer the alloy; it looks like an amalgam that was not properly amalgamated. It is hard to make these alloys in definite proportions. It is about nine parts sodium and one part potassium. This is a granular substance and if I wanted to use the sodium potassium at all, which I do not care to use very often because I prefer the phenolsulphonic acid, but if I did not have that I would prefer the sulphuric acid—if I wanted to use this alloy I would use this alloy which is about nine parts sodium and one part potassium.

Dr. Callahan spoke of his sulphuric acid, especially in the fifty per cent. solution which he originally introduced, as having a carbonizing effect upon the side of the tooth structure. He referred to a quotation of Dr. Cassidy where the latter has told us that the sulphuric acid extracts two atoms of the material that forms the side of the root and leaves the carbon. It will do more than that. Sulphuric acid when put on ordinary tissue will char the tissue; it will burn it if used too strong; and Dr. Callahan has cautioned you that if you use sulphuric acid not to use it too strong, so that you will not get that charring or carbonized effect on the scarred tubuli or the side of the canal. With phenolsulphonic acid you cannot carbonize, you cannot char anything that is in that canal. I do not care what you use, as long as you take the time and the patience, and develop the technic to open up these canals. I think the sulphuric acid or phenolsulphonic acid neutralized as suggested by Dr. Callahan, by sodium bicarbonate, is the best chemical you can use. If you can use any other, well and good.

Now, Mr. Chairman, just a word to the young men of this audience. I have been a teacher of therapeutics for many years, and I have recognized the fact that the opening up of canals and the filling of canals is where therapeutics stops and operative dentistry begins. I do not know whether it belongs to the chair of therapeutics or to the chair of operative dentistry, and perhaps because I have realized that right here is the point where in my own school I have stopped and Dr. Johnson has taken on the boys at this point—I say because of this fact it may have been that my boys and Dr. Johnson's boys, if you will pardon a personal reference here tonight, have not been as thoroughly and as carefully trained along this line as they might have been.

But I want to say a word to these young men tonight and that is this: I do not want you to apologize to yourselves or to any patients or to your profession, because you cannot afford to buy an X-ray apparatus and radiograph all the teeth that you are called upon to treat. I do not believe it is necessary, and yet I recognize the value of the X-ray. I will not take a second seat to anyone in the recognition that I give and the value that I know is attached to the radiogram. Nevertheless, I want to say with all the emphasis at my command, that I do not believe it is necessary for me to check up on myself every fifteen minutes with an X-ray in order to see whether or not I am progressing properly down a root canal. If I will put my energy and my brains into the opening up of these fine tortuous canals, as they must even today be so considered, I know that I go dangerously near to the end of the root by my technic, and I want to tell you in the first place that I have some confidence left in Nature. I do not know of any operation that the dentist is called upon to do where Nature will reward effort, put in the term of Dr. Raper, of Indianapolis, better than in the conscientious effort that the dentist uses in opening up these canals. The reason we have been getting a black eye about it, and justly so, by the medical profession, is because we have not been following the technic of Callahan and Rhein. We have been following the statement of manufacturers of root canal filling materials who tell us on the front half-page of our journals which we are forced to, and which we want to, read, that you do not have to worry about the pulp tissue in these canals, that all you have to do is to seal "our celebrated forever care for it" over the mouth where that canal ought to be, and no trouble will ensue. That is not the way to treat these canals. We must open up these canals and treat them after the methods of the men who know, not after the methods of the men whose only interest is to sell their "permanently antiseptic" —and there never was any such thing—root filling material.

Now, Mr. Chairman, I realize that I have taken up more time than I should, but, as I said before, this is one of the most important questions before the dental profession, and all we have to do is to do our duty as we know it; that is all; and the results, I think, will fairly well take care of themselves. I thank you.

Dr. Walter M. Pruyn:

Mr. President and Members of the Chicago Dental Society: When the Program Committee asked me to discuss Dr. Callahan's paper this evening, I did not feel fully capable of going ahead with it. I felt my meager knowledge and experience, and that I would rather not display them before this gathering. However, it has been an inspiration to most of us, I believe, to have heard this paper and these discussions.

The first point I wish to emphasize by way of discussion is the opening into the root canal. I think most of us probably fail there. It is the most important step because it is the first step. We must give sufficient room for direct access into each canal. That would apply to the molar teeth more particularly.

I think the frequent use of alcohol around and in the field of operation is also indicated, not only because it is a splendid cleansing agent, but for its dehydrating properties. I think, also, that the technic of the broaches in the canal should be further emphasized, as long as we are emphasizing the chemical cleansing.

The use of sulphuric acid and sodium bicarbonate is certainly indicated in the difficult canals more particularly. Personally, I have been using potassium hydroxid in place of the sodium bicarbonate.

It has been a rare treat to have heard Dr. Buckley and Dr. Eisen discuss this paper. There is hardly anything further that I would care to say other than what has already been said. I thank you.

Dr. Callahan (closing the discussion):

Mr. President and Gentlemen: I think you will agree with me that we do not expect to save all of the devitalized teeth that we meet in our experience, but we can cut down the percentage of losses. We have no right to expect to cure every case; and I repeat that the cutting down of the percentage of fatal cases is all that we can hope for.

I have trouble in getting many men to understand the technic, simply because, I believe, the majority of them do not try. So I would suggest to anyone who cares to undertake the following out of this technic, that they read slowly and carefully, and then provide themselves with about a dozen extracted teeth and the necessary instruments, etc. Then, with the teeth held in the hand, with canals and instruments in plain view, prepare and fill the root canals. I do not believe any man is prepared to undertake the filling of root canals within the mouth until he has had such technical training. There is much more that might be said along that line.

It has been said that seventy-six per cent, or about that percentage, of root canal fillings are failures, and I think it is because we have not had this practical training. We have not tried to study it out. I know you men of the Chicago Dental Society have had the technical training in the preparation of cavities for gold fillings. If the same amount of patience, care and time is spent on the preparation of a root canal as is spent on the preparation of a cavity for the reception of a gold filling, there will not be seventy-six per cent of failures in the cases of attempted root fillings.

And then another point we should remember—I have not gone into that part of the subject so far as this paper is concerned, that deals with the treatment of the conditions beyond the root canal—and I wish to make clear this point—that it is my belief and I think it is the belief of every man who has been a student in this line, that even though you have a perfect root canal preparation and a perfect root canal filling, that will not *alone* insure against a recurrent abscess; not by any means. There are conditions beyond the root that are to be taken care of. You understand that when the matter is brought to your attention.

Mr. President, I said in the beginning that I always feel bashful when I undertake to read a paper to this society, because I realize there are so many men present who know more about the subject, whatever it may be, than I, and men who could express themselves more clearly than I can. Dr. Buckley's discussion has proven that to be the case.

I am perfectly willing to use the phenolsulphonic acid if it will meet all the conditions that twenty-five years of clinical experience has taught me to demand. It is quite possible for one to become wedded to one's own theories. I may be prejudiced, it remains for you to decide.

I thank you.

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EDITORIAL.

THE BEST YEAR YET.

Nineteen hundred and sixteen is to be the best year yet. Whatever the achievements of the past, this year must surpass them. We are just on the border of so many significant studies related to dental progress that the next twelvemonth must assuredly reveal a marked advance in our classified knowledge. We shall know more about pyorrhea alveolaris, and surely we need to. We shall have additional light thrown on the problem of dental caries, and on the burning question of root canal work. We shall have a clearer vision of the significance of focal infection in the mouth as a factor in general disease, and we shall discriminate more and handle our cases better. We hope that we shall not extract so many innocent teeth as we are today, and we also hope we shall not grow indifferent and leave diseased teeth in the mouth as a menace to the welfare of the patient. In short, we hope we shall have better judgment.

Another thing—the year 1916 must see the suppression in a marked degree of the commercialism that has been rapidly creeping into the dental profession. In these days every man apparently has something to sell, and there is an eternal elaborating of the best methods of selling it. All the time and everywhere the profession is admonished to have an eye on the main chance, and look out for number one—seldom is anything said about consideration for the patient or the one who pays the bills. The whole aim seems to be to exploit the public. The words "equity" and "justice" are rarely mentioned in our professional literature today, and in their places have crept the besmirched and slimy creeds of avarice and graft. To do the other fellow and do him brown is the supreme aim of the hour. This must be suppressed, and 1916 must do its share.

This year should be—must be—consecrated to seriousness of purpose. Existing conditions all demand it. The great war which is being waged has placed the dental profession in the limelight as it never was before, through a practical demonstration of the significance of the service we render. More and more the world is turning to dentistry to solve some of the problems which have till now remained unsolved and which other professions seem powerless to cope with. The challenge is thus thrown to dentistry with a new significance, and we must accept it with our face turned toward the light. Earnestness of application should be the watchword of the year to come, and every man who practices dentistry should feel the urge, accept the challenge, and consecrate himself anew to further the best traditions of his calling. Nineteen sixteen must be the best year yet.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Keep Modeling Compound from Sticking to the Fingers:—Modeling compound, particularly if softened with dry heat, is likely to stick to the fingers. This can be prevented by rubbing a little coca butter on the fingers.—*H. Reid Staley, Oquawka, Ill.*

Doriot Handpieces:—If the clutch does not hold the bur, remove the clutch bar, take a knife edge carborundum stone and grind the spaces larger on the clutch, so it can come closer together, and the hand piece will last indefinitely. Do not buy a new hand piece.—*H. E. Biler, Chicago.*

Burnishing Silicate with Glass Rod:—When making a gold inlay for an anterior tooth and placing a silicate facing over the exposed portion it will be found advantageous to burnish the silicate to place with a round glass rod which has been bent in a Bunsen burner to a foot-plugger form. This works most perfectly for these combination fillings.—*M. J. Homan, Arnhem, Holland.*

Excessive Gold in Inlays:—If you find an unexpected excess of gold in your cast inlay, and that it requires undue grinding, you have probably removed the sprue prematurely from the invested wax model.

Have the investment hard and the wax model soft before removing the sprue; otherwise the force used will cause the investment to "give" sufficiently to cause the annoyance.—*Clarence H. Wright, Chicago.*

A New Use for the Automatic Mallet:—In removing vital pulp from a tooth, time may be gained by using an automatic mallet instead of the usual hand pressure instruments. First insert iodrenalcain in the cavity, then pack it with temporary stopping and press two or three times with amalgam instrument. Then select a gold plugger point that fits the cavity and give ten or twelve blows with the automatic mallet. After this procedure, remove the pulp.

This method eliminates soreness of the tooth, saves time, and is exceedingly gratifying to the patient.—*William Cann, Chicago.*

To Sterilize Cotton:—When we use cotton rolled on a broach with the fingers, or cotton rolled between the fingers, we are not certain that it is sterile. In fact, we may be almost certain that it is not sterile. To sterilize cotton thus treated use a mica chimney, such as is used for the Welsbach lights, and adjust it to the gas Bunsen burner on the bracket or cabinet. Turn the flame up or down to regulate the heat. Hold the cotton on the instrument over the top of the chimney, where the heat is concentrated, till the cotton is slightly scorched. If you will note it carefully you will soon learn to judge just where to hold it in order to sterilize it.—*H. H. Spitz, Chicago.*

Old Things Made New:—After 64 years' use of the continuous gum method, having purchased an office license of Allen's agent in 1851, I feel a right to criticize a so-called new method of constructing this kind of work, as described in two dental journals. It is simply the reproduction of an old method which I had abandoned many years ago.

When the work was first made the only teeth to be used were the plain flat incisors and the usual bicuspids and molars. The instruction given by the agent was such that I said, if followed, the work would prove a failure; and so it did in the hands of a dozen dentists who purchased the license.

I saw that there was merit in the work if properly used. The method as given by the agent was really as good a one as that used in the new construction. My method hinged upon anchoring the teeth to the plate by backing and soldering, and not only that but also by uniting the backings of the anterior teeth with a strip of platinum. In those days we did not cover the palatal surface of the plate. The work proved a success. I saw a set in wear forty years afterward.

But when the continuous gum teeth were introduced a new era came in the development of this ideal denture, enabling the operator to produce a perfect piece of work. The effort to bring into use the once discarded plate teeth is going backward. A proper festooning of the gums cannot be produced without the roots on the teeth.—*L. P. Haskell, Chicago.*

Indirect Method of Inlay Making with Modeling Compound Impression and Amalgam Model:—It has been thoroughly demonstrated, beyond a doubt, that no more accurate impression can be made with any material than with modeling compound, if intelligently used, hence the modeling compound impression. The amalgam models are easily made, using the copper amalgam. Heat in ladle till mercury beads come out all over it; put into mortar and work up as any other amalgam. Heat again if too dry, but don't burn it. If this does not bring out enough mercury add sufficient to make it plastic, then carefully pack it into your impression. This amalgam can be used over and over again. Crush the old models into small bits and they can be reduced to a plastic state much better in the heating process.

Prepare your cavity as for an inlay in the direct method. Take a piece of casting wax and place into the cavity and have the patient bite into it and lay it away. This will serve as your guide after your metal model has been made by slipping it into the cavity, giving you the occlusion, and contact point of the adjoining tooth.

Now take a piece of thin metal, sheet steel, and cut a matrix to come down to the gum and wide enough to extend past the margings bucco-lingually; the outer edges should be curved so as to force the material around the margins. Let the matrix extend above the occlusal surface sufficient to clip it on either side and bend a part of it back over the occlusal surface of the adjacent tooth, which will keep the matrix from being forced into the gum. If necessary, slip a wedge in at the cervex of the tooth, but do no let the matrix bind the margins of the cavity for you want the soft compound to be forced out at all points, and the matrix to hold it against a little of the tooth all round so you will have clean cut margins, and the matrix will prevent the compound from wedging around the other tooth. With matrix in place, take piece of modeling compound in the form of a stick and heat one end, leaving hard material behind it. Place in cavity and force into cavity so it will squeeze out all over the margins. This soft material will follow lines of least resistance, so make your cavity along that line. Chill and remove.

Make metal model as directed, work the bite to place by melting all around margins, saving contact point and occlusion. Cast and place back in model. Place in swager and hit a rap. Finish off model, trying it till satisfied. Polishing or grinding on the amalgam model will bring the mercury onto your gold. My swager is a tube of steel with a plunger to fit, and some soft rubber, about 40 cents.

See that your rubber is well about your model when swaging. If your technique is right, your inlay will be perfect.—*Miller W. Rice, Kansas City, Mo.*

MEMORANDA.

BOARD OF DENTAL EXAMINERS, NORTH DAKOTA.

The next meeting of the North Dakota State Board of Dental Examiners will be held at Fargo, N. D., January 11, 1916. For further information address W. E. Hocking, Sec'y., Devils Lake, N. Dak.

MINNESOTA STATE DENTAL ASSOCIATION.

The thirty-third annual convention of the Minnesota State Dental Association will be held at the University of Minnesota, in Minneapolis, February 11 and 12, 1916. Max E. Ernst, Secretary, 614 Lowry Bldg., St. Paul, Minn.

WASHINGTON UNIVERSITY DENTAL ALUMNI ASSOCIATION.

Come home to the "Golden Jubilee" of the Washington University Dental School, February 21 and 22. The meeting will be held at the Dental School, 29th and Locust streets. Prominent educators will present an excellent program and the manufacturers' exhibits will be unsurpassed.

WISCONSIN STATE DENTAL SOCIETY.

The Wisconsin State Dental Society at their annual meeting held in Oconomowoc, Wis., July 13, 14, 15, elected the following officers: President, O. G. Krause; Secretary, Theo. L. Gilbertson; Treasurer, Adolph Cropper. The 1916 meeting will be held in Wausau, Wis., July 11, 12, 13.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

The annual meeting of the American Institute of Dental Teachers will be held at Hotel Radisson, Minneapolis, Minn., January 25, 26 and 27, 1916. There will be a number of interesting papers, reports and discussions by prominent dental educators. All dental teachers are cordially invited to be present. J. F. Biddle, Secretary, 517 Arch Street, N. S., Pittsburgh, Pa.

ARKANSAS STATE DENTAL ASSOCIATION.

The Arkansas State Dental Association will hold its annual meeting at the Hotel Marion in Little Rock, Arkansas, March 28, 29 and 30, 1916. We have arranged to have some special lectures by Dr. T. P. Hinman, Pres. Nat'l Dental Ass'n, of Atlanta, Ga.; Dr. M. L. Rhein, of New York, and Dr. C. N. Johnson of Chicago. In addition to these lectures, we will have the largest number of instructive clinics ever demonstrated at our meeting. Every ethical dentist in the state is cordially invited to be present at this meeting and affiliate with us. Wm. B. Dormon, Sec'y-Treas., Nashville, Arkansas.

ANNUAL CLINIC CHICAGO DENTAL SOCIETY, JANUARY 28-29, 1916, HOTEL LA SALLE, CHICAGO.

The annual clinic of the Chicago Dental Society bids fair to surpass in efficiency and enthusiasm our splendid clinics in the past. A notable list of clinicians have been selected and arrangements are under way for a clinic which will place before our guests and members the best in modern scientific dentistry. The evening meeting on Friday, January 28, will mark an epoch in dentistry. The banquet will be held on Saturday evening, January 29.

Reservations for rooms at the La Salle Hotel, Chicago, may be made any time. Banquet tickets may be had by addressing Dr. S. W. Fahrney, 25 E. Washington St., Chicago. The official program will be issued January 1. Exhibitors desiring space may communicate with Dr. L. Strong, 30 N. Michigan Ave., Chicago. Frederick B. Moorehead, President.

Percy B. D. Idler, 30 N. Michigan Ave., Chicago, Secretary.

NONSUIT IN DENTIST'S CASE—MISS LEONA SHATSICK FAILS TO PROVE DAMAGE BY DR. FRANK RODGERS.

Miss Leona Shatsick of 4851A Easton avenue, was nonsuited yesterday in Circuit Court Judge Kimmel's court in her suit against Dr. Frank Rodgers, a dentist in the Wall building, Vandeventer avenue and Olive street, for $10,000 damages for alleged improper treatment of her teeth.

She stated that in August, 1911, she engaged Dr. Rodgers to straighten three teeth and that he applied clamps which irritated the gums and caused a tumorous growth. She had three operations performed, which cost her $250, she asserted.

At the close of her testimony counsel for the dentist filed a demurrer, averring that the evidence did not bear out the petition. Judge Kimmel said he would sustain the demurrer unless the plaintiff chose to take a nonsuit, which was done.

Judge Kimmel said that, according to the evidence, the trouble could have resulted from other causes than the treatment given by the dentist.

—*St. Louis Paper.*

MEN WANTED.

WANTED—Several men competent to take positions in large hospitals and for research work, to assist in interpreting the relation of mouth infections to systemic disease and to direct the operative procedures for the oral lesions. These men must, by training or experience, or both, have each a medical and dental vision. They should also be skilled bacteriologists and pathologists. Applicants will kindly communicate with Weston A. Price, President of the Research Institute of the National Dental Association, Cleveland, Ohio.

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WHAT SHALL WE DO WITH PULPLESS TEETH?*

BY THOMAS B. HARTZELL, M. D., D. M. D.

(Research Professor of Mouth Infections, School of Medicine;
Professor of Oral Surgery and Clinical Pathology,
College of Dentistry.)

The speaker has had this question asked him almost daily now for a year or two. The questions have come from North, East, South, and West. That he should be questioned is not strange as no one has labored with greater energy to indict the pulpless tooth together with its running mate, the pyorrhea pocket, of all the crimes in the pathological calendar. Having labored so hard to indict the pulpless tooth, I trust that you will not infer that I am inconsistent if I now attempt in some measure to exonerate it.

It is absolutely true that the pulpless tooth has been made to suffer for many sins for which it is not of itself responsible. It is always pleasant and convenient to find some one upon which to lay the blame when things go wrong. It is always more comforting to have the world think it is not your fault but the other fellow's fault for any unpleasant event which occurs. Therefore, I am not surprised that there are a considerable number of my fellow practitioners, who are willing to jump to the conclusion that the train of evil events growing out of infection about teeth is not chargeable to any neglect of ours and go calmly on practicing the same type of dental surgery that we have always practiced, quietly failing to charge the evil results of infection to their proper source; to wit, the infected gingival crevice with its unprotected openings leading to the arteries, peri-vascular lymph spaces, the veins of the peridental tissues, and the septic root canal, all presenting conditions which are within our power to remedy.

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*Read before the Minnesota State Dental Association, June, 1915.

In order to answer some questions regarding the pulpless tooth, I will put before you the following argument, but as a premise to that argument let me say that it is now many years since surgery has recognized that the greatest foe to successful surgery is infection carried on the hands and utensils of the surgeon. Therefore, the most careful precautions have been adopted by surgeons to eliminate preventable infections, such as the wearing of the sterile rubber glove in addition to most painstaking care in the cleansing of the hands. The instruments used by the general surgeon, including sutures and needles, are brought directly from the sterilizer. In many operating rooms, they are not allowed to be exposed to the dust of the atmosphere but are immediately submerged in sterile water, and the field to be operated upon is made as nearly aseptic as possible without injury to the tissues. These precautions, gentlemen, have cut the death rate in many of the more important operations to a fraction of a per cent. In the old days, before the knowledge of bacteriology had reached its present level, the author recalls a series of incidents in which, owing to lack of aseptic precautions, an obstetrician lost the lives of six mothers in succession during that period of time when he was also attending a case of erysipelas. This was many years ago, but it illustrates one of the great crises through which medicine and surgery have successfully passed, though at the expense of human life, just as our problem has cost human life.

The methods of dentistry are at the present time hanging in the balance. When heart, arterial, kidney, and joint infections are absolutely proven to proceed in many instances from infection originating in the dental path, you may rest assured that medicine and surgery will demand of us as they are demanding of themselves, efficient precaution against infection and successful treatment of preventable infection. Therefore, our question, what shall we do with the pulpless tooth, assumes an importance worthy of consideration of us all.

First and foremost, is the sterile well-filled tooth a menace? My answer to that question is most emphatically, no. However, the pulpless tooth of the future must be handled by vastly different methods than the methods of the past to escape condemnation. We, as a profession, will have to unite in greater effort than we have hitherto put forth to maintain dentistry on its present high level by giving to the care of the pulpless tooth or the tooth to be devitalized, hours of time, where in the past, we have slurred it over with little consideration. To accurately remove the pulp, where removal is possible, and fill and protect root canals of a molar, means the work oftentimes of two or three hours, and to remove root filling from an imperfectly filled root and purify and re-fill the canals, may involve double that expenditure of time. The question which confronts us as practitioners in the question of the pulpless tooth is, are we willing to educate our patients to the need of this work and do it in such a manner as to protect them from serious damage? If we are not, then we must squarely face the issue which is extraction for all that type of case in which misfortune of decay has exposed the pulp to infection. For that other type of case, in which bridge work must be placed, we are confronted by the necessity for applying bridges to our teeth in such a manner that the pulps may be preserved. The placing of bridges upon teeth containing living pulps versus the placing of bridges and crowns upon teeth from which pulps have been removed is attracting much attention and much can be said on both sides of that question. I here present for your study a common example in which a crown has been placed upon a vital tooth, which subsequently died and I wish to say in this connection that some of the worst cases of infection that it has been my fortune to see in the dental clinic and private practice, have resulted from the death of teeth which were not devitalized previous to crowning. The presence or absence of abscess depends upon two things primarily, the admission of micro-organisms to the tissues and the decrease of resistance of the individual who has long been sensitized to them by absorption of their poisons into the circulation from some focal point or their constant ingestion in the saliva. The recorded cases of the speaker, of vital teeth showing abscess for two years, and of C. J. Grieves of Baltimore for one year is fifty vital teeth showing abscess.

During the past winter, I have noted thirty cases of teeth which were bearing crowns, which teeth had subsequently died as the result of infection and extra stress placed upon them in bridges. It must be remembered infections resulting from death of pulps under bridges always cause the loss of the bridge, whereas roots from which the pulps have been removed and properly treated from the standpoint of asepsis, which undergo the misfortune of abscess, frequently may be saved. In view of the arguments offered for and against the preservation or destruction of tooth pulps in the statement made, it seems to me only fair to operative dentistry that we should all endeavor to perfect ourselves in a method or methods which will lead to few infections through the dental path. In other words, close the door to infection.

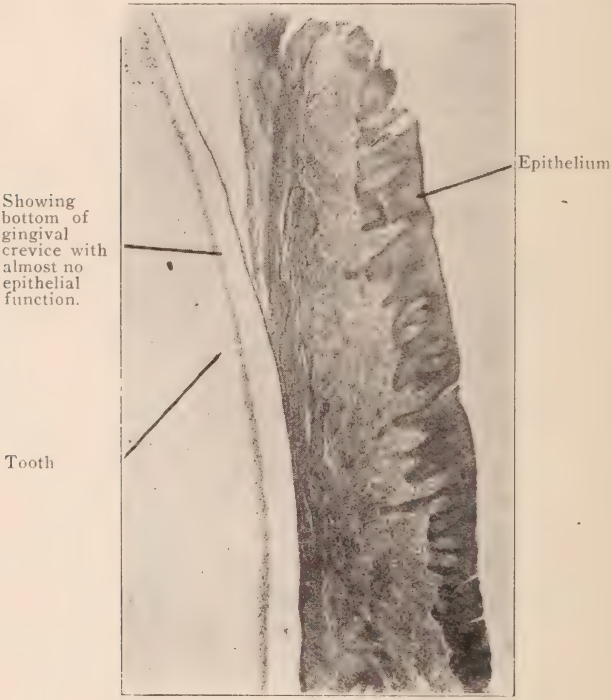
Epithelium
Showing bottom of gingival crevice with almost no epithelial function.
Tooth

Fig. 1.

Normal human gum margin.

I have record of one hundred and fifty teeth which were found to contain dead pulps which teeth were perfect as to their structure, presenting no decay or abrasion, the death of the pulps having been produced by some influence not known to the patient. I have also record of and can show you a lantern slide of teeth that are apparently abscessed, presenting a clear area of rarefaction about the root ends which contained, when examined, vital pulps. In fact, I have two recent cases in which we have large abscesses involving a lateral and central, which in operating to shell out the abscess sack, exposed both the central and lateral root tips leaving them standing in view, the central containing a living pulp in seemingly good health with the pulp of normal color and vital. Therefore, we have evidence to show that the focus of infection about teeth does not necessarily depend upon destruction of the pulp itself. The one hundred and fifty devitalized teeth just mentioned doubtless were devitalized by the admission into the circulation of the pulps of bacterial emboli. Possibly, as most of them were abscessed, the abscess commenced in the apex of the socket, because the apex of the socket is the most likely place for bacterial emboli to lodge whether the tooth be vital or non-vital. The anatomical relations favor the deposition of bacterial emboli in the apices of the tooth's socket because some of the vessels there are terminal. (In this connection, I wish to trace the direct path from the gingival crevice to the tooth apex which is well illustrated by the recent work of Doctor Henrici and the published work of Professors Black and Noyes, showing some of the vessels in the peridental membrane.) If bacterial emboli lodge and multiply in the terminal vessels, which supply the tissues about a root end, the result is abscess whether the tooth be vital or pulpless. Much has been written recently regarding the pulpless tooth and it has been charged by Ulrich* with being the direct cause of the locating of abscess in the socket ends. This I believe is wrong. Because we find abscess by Roentgengram in the neighborhood of many pulpless teeth it does not necessarily prove that the pulpless tooth must necessarily lower the resistance of the tissues in which it is, nor does the finding of abscess prove that the pulpless tooth was necessarily the agent that brought about the abscess. Many of the pulpless teeth that we find by radiographic method were abscessed before root canals were filled and many of them abscessed after the root canals were filled, and, as I have shown in the foregoing sentences, we have vital teeth with abscess located about the root ends of those same vital teeth, so here we have a great question confronting us, namely, why does the dental abscess locate itself generally in the tips of sockets? When we can satisfy ourselves as to why abscess occurs more often in this locality than in other localities, we have the first clue to the answer to this question, which is so vital to the future of dentistry. I never have been one to make dogmatic statements regarding pathological conditions unless the data offered has been proven to be absolutely true, and I do not

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*Dental Review.

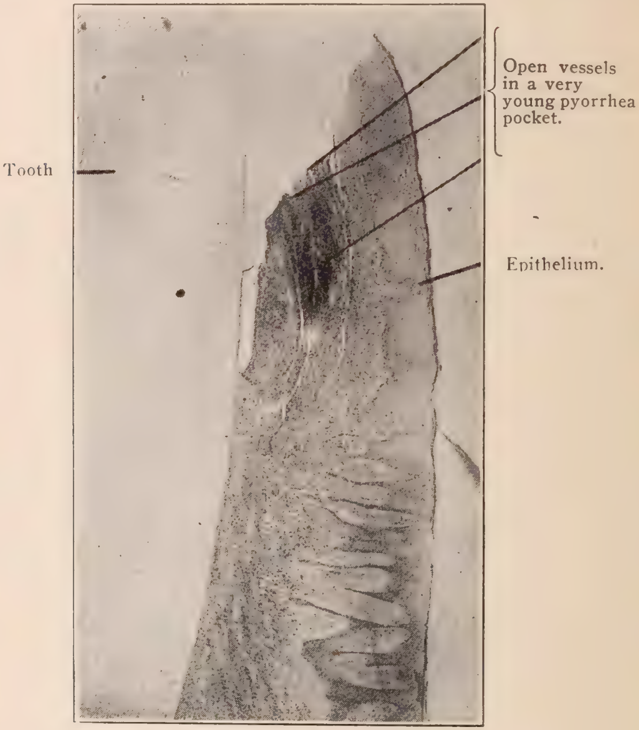
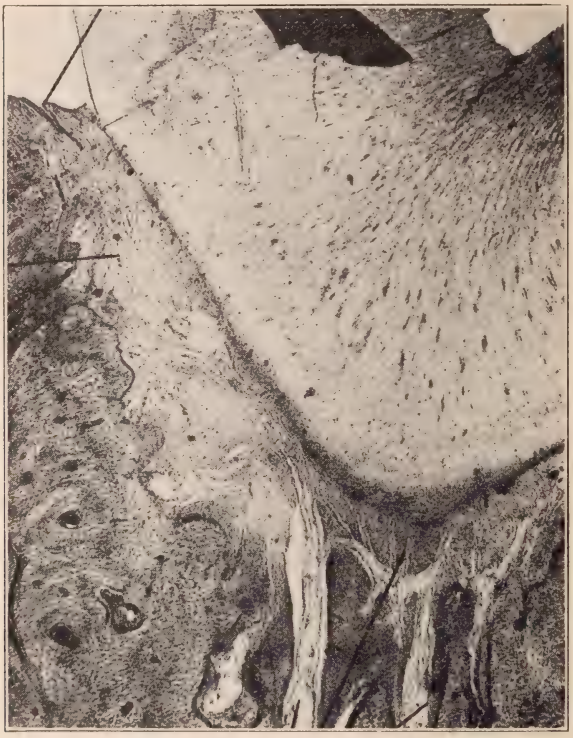


Fig. 2.
Human pyorrhea pocket.

propose in this instance to make dogmatic statements regarding the dental abscess. I do desire, however, to offer a reasonable explanation for the prevalence of the dental abscess about root ends, either of teeth which have had the pulp chambers opened and the roots filled or of teeth belonging to the group where the pulp dies before the pulp chamber has in any way been interfered with. In order to present this matter in a way absolutely fair to all theories, allow me to discuss the bacterial conditions in the environment of the tooth, and illustrate, by photographs and dissections, what seems to the writer to be the logical explanation of the occurrence of the dental abscess.

We all know the following facts to be true. First, that the mouth is constantly the habitat of the organisms found in dental abscesses. Second, that the tooth surface is at all times capable of furnishing the streptococcus viridans, which is the streptococcus commonly found in the chronic dental abscess, and the staphylococcus found in the acute dental abscess. That these cocci grow on the tooth surfaces and tooth necks and at the gum margin crevice is known to every bacteriological student who has taken cultures from this field. In the teaching of our dental students in the bacteriological laboratory, it is the custom to make smears and cultures from the tooth neck and gingival crevice and I believe there are few exceptions to the general rule that these organisms will appear in cultures taken from this field. It is true many other organisms may be found in the field also, but as we find the streptococcus universally present in the chronic dental abscess and universally present at the gum margin, the task which lies before us is to find how this streptococcus happens to locate itself in the peridental structures and about root ends. An examination of the tissues contiguous to the teeth by cultural methods shows this streptococcus is present in them. It is never present in great numbers and it is difficult to find in sections of the tissue. I have occasionally seen it, but to prove its presence beyond any shadow of doubt, a clipping of gum margin dropped into culture media always produces streptococcal growth. If you acknowledge this fact to be true, then you certainly have a rational explanation of one source by which this organism may enter the tissues, and, if you study the gingival crevice, you will see that it commonly presents such imperfections as those I show on the screen. The epithelial cells forming the exposed mucous membrane are several layers in thickness and tangled among the loose epithelial cells, we find the organism liberally distributed. The inside epithelial layer of the gingival fold is much thinner than the exposed outer surface of the gingival edge and the deepest part seems always to have present in it small openings. Why these openings are here, we do not as yet know. They seem, however, to be trifling imperfections in the epithelial protection of the bottom of the gingival crevice. In order to demonstrate the fact that these openings exist, I will at the close of this hour do the following experiment. From a small tank in which we have


Open vessels leading into peridental membrane from gingival crevice.
Open vessels.

Open vessels in peridental membrane.

Fig. 3.

an oxygen pressure of ten to fifteen pounds to the square inch, I will draw the gas through a rubber tube, discharging it from a blunt nosed needle just under the gingivae. It is not necessary to thrust the needle deep into the bottom of the crevice but allow the gas to escape under the gingivae with the point of the needle some little distance from the bottom of the crevice. You can then see the gas from the very fine blunt needle move the tissues. Sometimes, the gas flashes up into the capillaries of the mucous membrane. Sometimes, it will be seen in the form of bubbles issuing from the socket of a neighboring tooth having entered the tissues through these openings in the bottom of the crevice and passing through the tissues escaping from a point perhaps half an inch or three-quarters of an inch distant from the point it entered. It is comparatively easy to demonstrate these openings and I believe that eight out of every ten teeth will admit the gas when the stream is directed toward the bottom of the crevice and this is an experiment any one of you may try for himself and ought to be conclusive proof to any one who works the experiment out that there is an open door to the circulation at the bottom of the most deeply infected and dirtiest area as far as bacteria are concerned in the whole body, the only area absolutely unprotected from bacterial incursion.

The circulation of the peridental membrane is rich in the gingival neighborhood, a part of the blood coming in through vessels in the periosteum and dipping into the socket over the edge of the alveolar process. It is true that vessels also enter through the bone of the socket, but if you will observe the sockets from whence the teeth have been removed, you will notice that the inner surface of the socket is hard and contains comparatively few openings and if you study the histology of the distribution of vessels and capillaries to the peridental membrane, you will be convinced that the apex of the socket is supplied in part by capillary ends. Hence, germs entering the peridental membrane in the gingival crevice are naturally carried toward the socket apex, particularly is this true of the perivascular lymphatics and veins, and, as small arterioles subdivide into smaller and smaller vessels, the possibility of bacterial emboli lodging at the point of bifurcation is constantly increased, so that the apex of the socket is a likely place for bacterial emboli to locate infectious material. Some of the vessels enter through bone passages and spread out in the fibers of the membrane passing on to enter the root apex, where again it is impossible for the coat of the vessel to expand, and, if irritants are applied, the blood channel can only respond by swelling, which narrows its lumen, thus creating a favorable field for bacterial development. If the bacterial embolus is very small, it can and may enter the pulp chamber itself and be left stranded in the pulp. When this occurs, we have acute pulpitis, death of pulp, and pus formation within the pulp chamber without having exposed it at all.

During the past two years, I have recorded twenty-seven dental abscesses occurring on vital teeth. These abscesses, I believe, occurred as a result of the admission of bacteria from dirty root surfaces into the tissues gaining admission to the blood stream from the bottom of the gingival crevice, being carried upward and lodging at the bifurcation of arterioles. When the embolus is of sufficient size to prevent its reaching the apex of the socket, we find the abscess occurring on the side of the tooth perhaps midway between the tooth root and the gingival margin. Where the bacterial mass is smaller, it may reach the socket apex. Then, we have our abscess around the root end. Where the bacteria manage to pass through the apical foramen, the abscess may occur in the body of the pulp itself. Therefore, you see the shape of the socket and the bifurcation of vessels particularly favor the locating of the abscess in the tip of the socket. The act of mastication, driving the tooth about 1/60-inch into, and the rebound or lifting the tooth out of the socket, further favors bacterial distribution. To microscopically demonstrate bacterial masses on teeth, one should saturate them plentifully with a solution composed of iodin, fifty grains; zinc iodid, fifteen grains; potassium iodid, fifteen grains; water, four drams; and glycerin, four drams. This solution should be frequently used and gives constant evidence of the presence of bacterial masses. The study of bacterial flora in either the dark field or the stained specimen offers further proof of the bacterial presence and finally culturing from the clipped off gum margin edges offers additional proof. Still further proof has been accumulated to show bacterial presence in the tissues around teeth. During the past two years, Doctor Henrici and the Author have been carrying on a systematic search to find bacteria-free vital tooth roots. We thus far have accumulated. ten such instances. Most all of the teeth extracted have yielded streptococci when the roots were planted in sterile media, even though the tooth necks have been cleansed as thoroughly as possible, rubbed with iodin, washed with alcohol and made dry. The ten teeth which Henrici reports bacteria-free were obtained in the following manner. In addition to rubbing the necks with iodin and washing them with alcohol, we packed dry gauze around them. We then used the white hot actual cautery, passing a thin blade under the gum margin and burning the tissues cleanly around the root. When this was done, the extractions were carefully made, endeavoring not to rub the sides of the socket with the root tips as they were withdrawn and we can only report ten sterile cases.

The universality with which we have found the streptococcus in the tissues about the teeth and the great difficulty of extracting teeth without using some drastic method for sterilization of the gingival crevice is therefore still further evidence pointing toward the gum crevice as the place of admission of bacteria which produces absecess, and the further fact that we have abscess on living teeth and the death of unexposed pulps and abscess about their root ends accentuates this fact.

The next lantern slide showing a filled root of a first molar in a healthy condition contiguous to a tooth crowned in a vital condition and later presenting abscess gives you the opportunity to see the fallacy of the argument that devitalization of pulps necessarily creates an area of lowered resistance to infection.

The other great common channel for infections of the tissues around the teeth is the root canal itself, when opened by accident or for the removal of vital pulps. That the pulp canal is the most direct route for admission of bacteria to the apical tissues must be evident to us all and the need for aseptic surgery of root canals was never better shown than in a paper by Doctor Elmer S. Best, read before the second district society of New York. In this paper, he gives the result of a research in which he has cultured from cotton holders, broaches, and the common utensils used in root canal surgery, showing them almost universally capable of developing bacteria on culture and presenting in this paper a technic and appliances for doing root canal surgery in an aseptic manner. Time and space do not permit me to quote this paper in its entirety but I will say briefly that the technic which he describes requires absolutely sterile material taken directly from the boiler for all root canal work, the exclusion of moisture and sterilization of tooth surfaces before entering the pulp chamber. This sterilization of tooth surfaces should be brought about by the plentiful application of iodin followed with a wash of alcohol and the removal of all infected tooth structure, the use of broaches wrapped with cotton and sterilized before use and not wrapped by the infected fingers of the operator at the time used, and lastly, the filling of the root canals with sterile material protecting that material with oxychlorid of zinc, which the research of Webster has proven to be the only bacterial proof cement at our command.

To briefly recapitulate, the dental abscess is the result of infection by pus-forming micro-organisms which gain access to the tissues chiefly through the peridental structures and root canals, occasionally by blood-borne bacteria from other parts of the body. For instance, in a badly absecessed tonsil, the chances of distribution in the general blood circulation would be excellent. A necrotic appendix or feruncle might furnish a shower of bacteria which might eventually locate in the apical tissues and produce abscess. As far as the dentist is concerned, however, a great responsibility exists because of the fact that pulp canals, tooth surfaces, and peridental structures, all infected, should receive from him a vastly better and more efficient type of treatment than they have in the past. That it is possible to evolve such a treatment can readily be shown by some of the following examples of teeth formerly abscessed, producing positive cultures before treatment, the root canals of which produced no culture after treatment and prior to filling of them, which teeth are now comfortable and useful factors in the masticating mechanism.

To summarize briefly the question of this paper, help your patients to maintain more nearly clean tooth surfaces, close the gingival gate to infection, devitalize few teeth, and, when you must devitalize, exclude bacteria absolutely. This may seem difficult but it can be done. Follow the method of Calahan in the filling of canals, and, if abscess does occur, sterilize by the Ionic method, given us by Doctor Rhein. Where this is not advisable, open the tissues and remove the abscess sack. Close the opening by suture, securing, if possible, primary union. In the presence of secondary infection, extract abscessed teeth.

THE TREATMENT OF SINUSES OF THE HEAD BY MEANS OF BISMUTH PASTE.*

BY EMIL G. BECK, M. D., CHICAGO, ILL.

I shall speak on a subject with which you are perhaps more familiar than I am. My experience in dealing with sinuses and fistulae of the head convinced me that the underlying principles of their origin, as well as the treatment, are very similar to those in other parts of the body. I have worked in conjunction with my brother, who has extensively employed *bismuth paste* in sinuses of the head, and after eight or nine years I have reviewed the results and compared them with those which have been obtained in other parts of the body and I have learned a great deal, and this I will lay before you, so that I may be able to help you in understanding this method of treatment more fully, because I know that I myself blundered before I learned the finer points of its application.

Practically all sinuses are preceded by abscesses, and therefore a sinus is nothing else than a shriveled abscess cavity. Many believe that sinuses, especially rectal, are channels caused by pus burrowing through narrow spaces from one part of the body to another. I am convinced that a sinus starts from an infection in either the bony structure or the parenchymatous organs and after the formation of an abscess, the pus spreads in the direction of least resistance and opens into either the skin or the bowels, the urinary bladder, or even the gall-bladder. After evacuation the cavity gradually shrinks and the sinus forms.

When the abscesses spread in various directions, they form multilocular abscesses, sometimes communicating, and at other times not, so that an astonishing network of sinuses may result. (Fig. I.) This fact was not known until it was demonstrated by radiograms of the injected sinuses.

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*Read before the Odontological Society of Chicago, October, 1915.

"The method, as you know, consists of injecting with a glass or metal syringe a quantity of bismuth paste (liquefied by

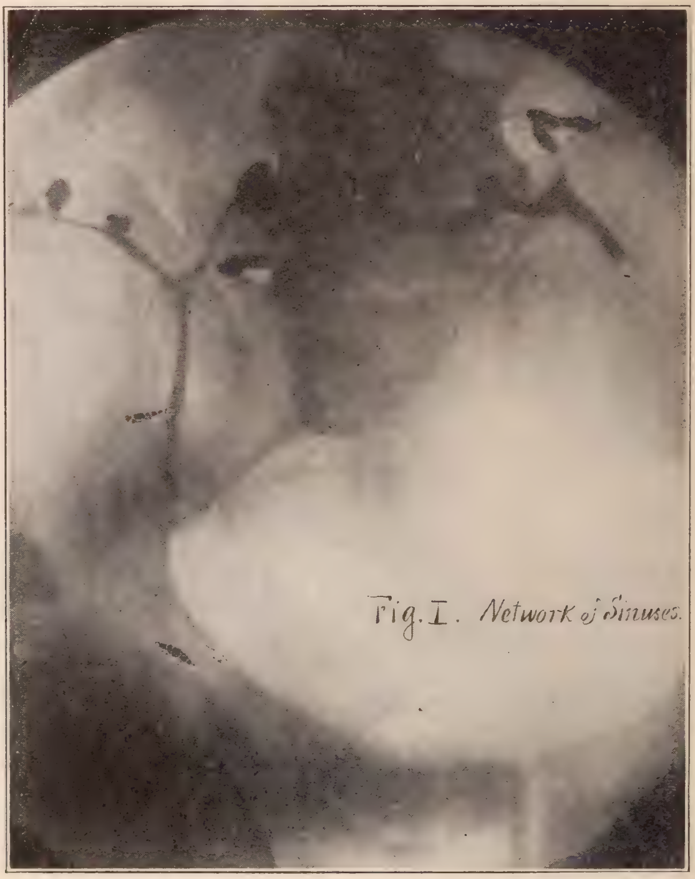
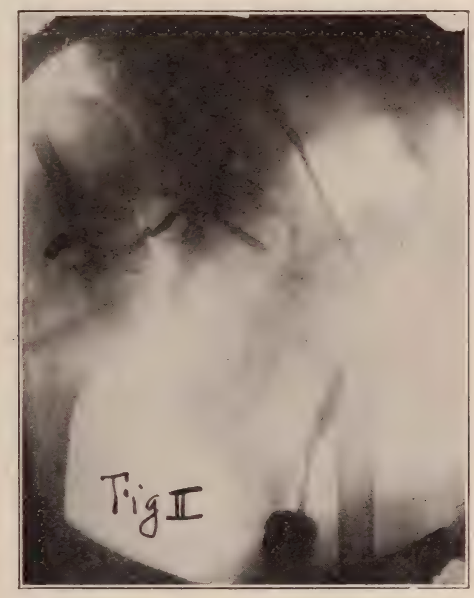


Fig. I. Network of Sinuses.

picture of the hidden labyrinth of channels, but will also lead us heating in a water bath) into an opening of a sinus until one feels reasonably certain that all ramifications have been filled. The paste, thus injected, will rapidly congeal and remain in the sinuses long enough to permit of taking a radiograph. The radiograph thus obtained will enable us to view not only a true to the focus from which the disease originally started (Fig. II), and in many instances reveal errors in our diagnosis which may cause us to change our entire course of treatment.

"It will require but little persuasion to convince even the most skeptical of the diagnostic value of this method. A glance at the radiographs in which the network of tortuous sinuses is clearly shown teaches us its advantages. We can all recall instances in which such a radiograph would have been of great assistance, and would have spared many an unfortunate a useless operation.



Sinus following Psoas abscess.

"Formerly we had to rely upon the probe or the colored fluids as pathfinders of sinuses, but these served as guides during the operation, while, only with this new method, are we able to make a correct anatomical diagnosis before an operation is decided upon, and thus we are able to discriminate between operable and non-operable cases.

"If an operation is decided upon, then the procedure is carried out with more thoroughness and precision, as we can work with definite plans before us."

Suppurative sinuses about the jaws very often communicate with the cavities of the accessory sinuses. Here they are not nearly so extensive as elsewhere in the body.

Sinuses frequently follow injury, such as gunshot wounds and fractures. Another type is from postoperative infections, after drainage, or even after clean operation.

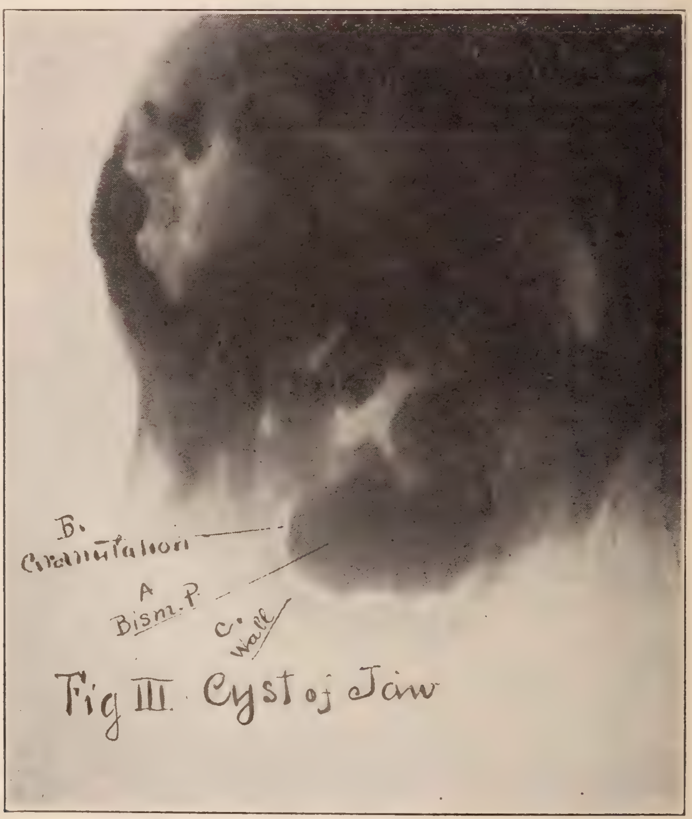


Fig III. Cyst of Jaw

Surgical operations for sinuses in the past have proven very unsatisfactory. In my brother's and my series of some 1,800 cases treated with bismuth injections, there were some which had lasted many years and had resisted all surgical treatment; one case had lasted sixty years, two others forty years. Since the introduction of bismuth paste, we have been able to separate the operable from the inoperable cases and thus avoid useless operations. The majority of the cases thus treated heal up without surgical intervention. Sixty percent have gotten well.

There are comparatively few reports in our literature, because most of the cases have been treated by country physicians, comparatively few of which find their way into the literature case reports.

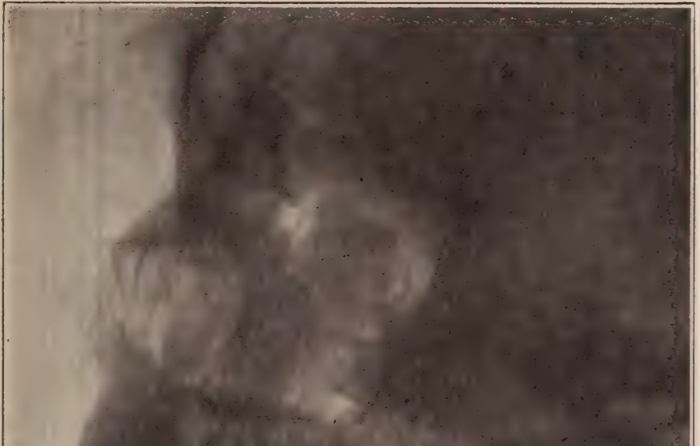


Fig IV

Root absorbed.
Steel Peg
in Abscess

The greatest objection advanced against the use of bismuth paste has been the occurrence of bismuth intoxication. Such intoxication has occurred only in large cavities, such as empyema of the chest. This, however, is practically impossible in cavities around the jaws, as there is no absorption from these small bony cavities to speak of, and this danger may be altogether disregarded in dentistry.

I have warned the profession not to inject and retain the paste in large cavities, such as empyema cavities; and since my repeated warnings, cases of bismuth poisoning have become rare, no fatal case, so far as is known, having occurred since 1912. In a series of 1,800 cases in our own practice, there was no fatal case. The first case in which I discovered the symptoms of in-

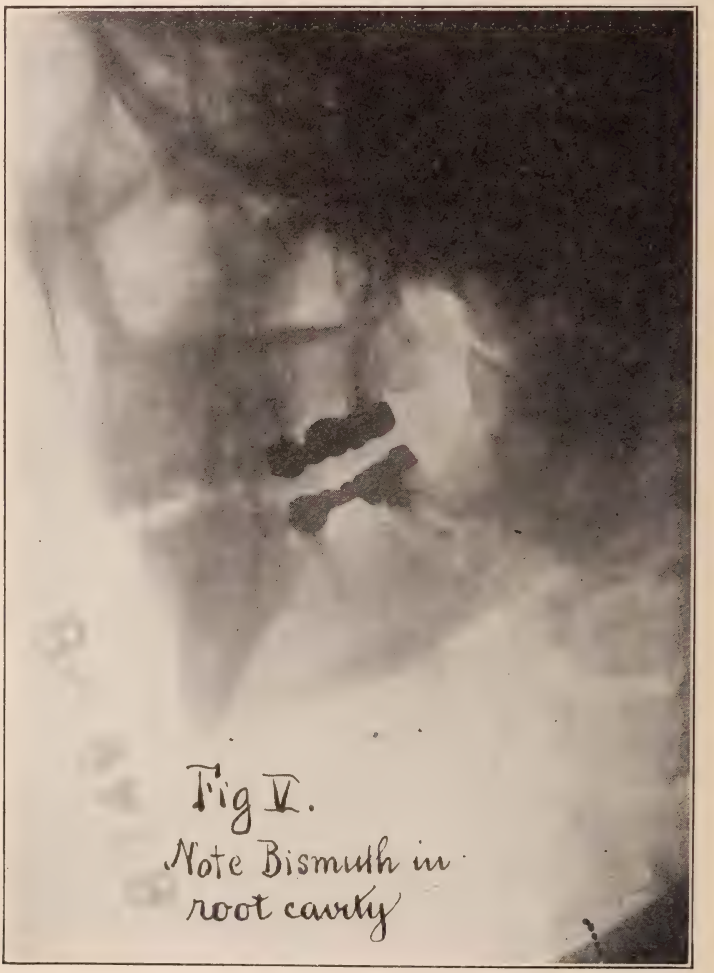


Fig V.
Note Bismuth in
root cavity

toxication was one of empyema. My identification of it was somewhat tardy, but upon proper treatment the patient recovered.

I will not speak of my own results, but I shall show you some radiograms, which will suggest to you the points of treatment. There are a number of cases in which the frontal sinus and the antrum of Highmore have been injected for the purpose of disinfecting these bony cavities. It is interesting to note that the antrum of Highmore viewed anteriorly gives a square outline, while viewed laterally it is triangular.

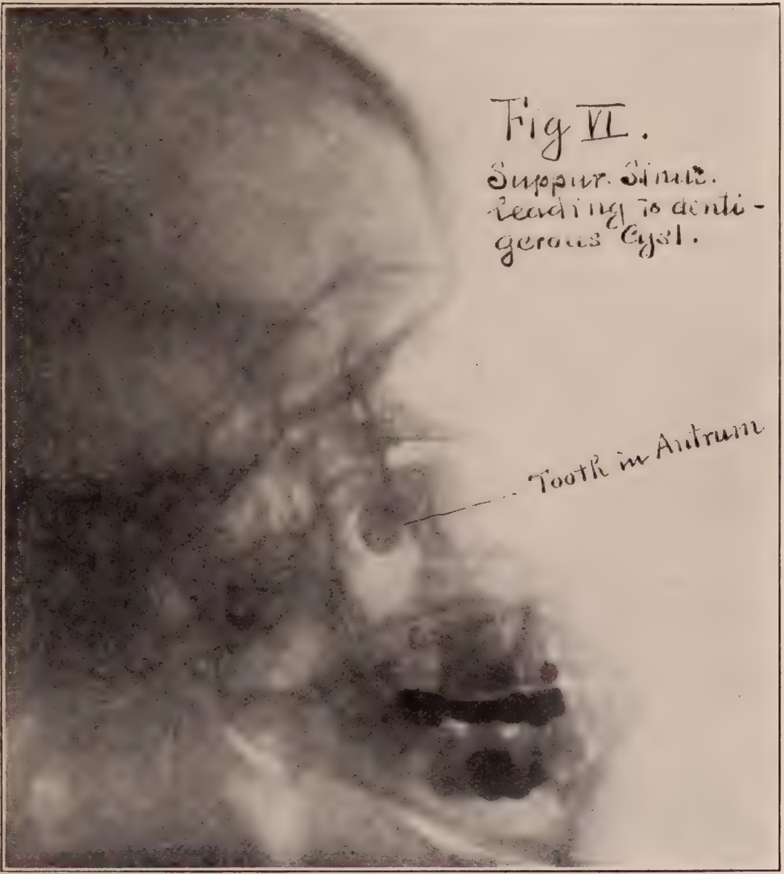


Fig VI.
Suppur. Sinus. leading to dentigerous Cyst.

(A patient whom Dr. Beck had asked to be present at this point arrived.)

This lady suffered with a cyst of the lower jaw for twenty years; two teeth having been extracted, the cavity became infected and the food constantly filled the cyst cavity and caused a great deal of discomfort.

After cleaning the cavity, it was injected with bismuth paste, and the radiogram shows that it takes in a large area of the lower jaw, holding about one-half ounce of the mixture. The radiogram (Fig. III) distinctly outlines this cavity, and around the bismuth injection (A) is a lighter shadow (B), representing the granulation tissue lining the cyst. Outside this lighter granulation shadow is the cyst wall (C), a great deal denser than the rest of the bone.

The outer wall of the cyst was crushed in through an external incision, and then the cavity packed every day with gauze saturated with bismuth paste, the strip being about one yard in length and about one inch wide. Thus the food was kept out and gradually the cavity healed and now has been closed for about five years, causing her no inconvenience whatever.

Bony cysts in other parts of the body are treated similarly. Here is a radiograph of another case treated in the same way.

The second patient I show you is myself. A year ago I went to Europe because of poor health, cause unknown. I was not very much benefited. I had constant suppuration from a tooth with a small sinus. I injected my own sinus, with improvement, but the suppuration returned. Upon my return in America I injected it and then took this picture (showing a radiograph). (Fig. IV.) Into this small cavity at the bottom of the root a steel peg projects, which was driven into the tooth when it was crowned. The pus accumulated in this pocket escaping at intervals. The tooth was extracted and it was found that the point of the steel peg protruded into the pus cavity. Upon its removal, the cavity was filled with bismuth paste and there was immediate healing, and there has been an improvement in my health since, proving to me that this constant absorption from the infected root was the cause of my poor health.

A third: A young lady had an abscess in the last molar, the same as in my case, and the bismuth paste went into the root of the tooth. (Illustrating the case by means of a stereoscopic X-ray picture.) (Fig. V.) This illustrates that for purposes of diagnosis the bismuth paste may be injected and a radiogram may then be taken and the extent of the affected root easily determined, as well as the advisability of removing the tooth. In this particular case the affected root was saved.

I will report an instructive case in which Dr. Brophy and your secretary, Dr. Roach, were called in consultation. A man fell down a three-story shaft, sustaining a fracture of the lower jaw in two places and a fracture of both condyles, so that the lower jaw was driven up and the mouth could not be closed. Three sinuses formed which discharged pus profusely around his chin. These sinuses were injected and after one week they closed and suppuration ceased. The mouth possesses unusual resistance against infection. In this case, after the closing of the sinuses, the teeth of the upper and lower jaw were wired together by Dr. Brophy, so as to immobilize the fractures. An opening was left by the extraction of two teeth to permit the ingestion of food. The patient's jaws were kept in this position for two weeks. The wires were then removed and union had taken place. He had a complicating infection of the antrum. Fragments of bone were scraped out and an injection of the paste was made. The patient is now well and able to chew his food.

I will refer to another case: one of dentigerous cyst. In this case the stereoscopic radiogram shows a tooth in the upper part of the antrum of Highmore. (Fig. VI.) A suppurating fistula is in the place of the last upper molar, the opening having existed for fifteen years. The injection of bismuth shows a sinus extending to the tooth in the cyst of the antrum. In operating, the antrum was entered through the nose; the patient blew his nose and the tooth came out through the nostril.

According to my brother, Dr. Joseph Beck, it is more difficult to cure cases of antrum disease by the injection of bismuth paste than suppuration in other parts of the body, because the granulations filling the cavities have almost unreachable recesses. The method which gives the best result is to open the antrum and scrape out the granulations and thereafter inject the paste.

In my brother Dr. Joseph Beck's practice, there occurred many cases of suppurative disease affecting the head, such as sinuses from syphilis of the scalp, also cases resulting from suppurating tubercular glands, which are easily cured by this means. I have had 12 such cases of suppurative glands in my experience, all of which were treated successfully with bismuth paste. This method has also been employed in the injection of the lachrymal duct. Professor Gradle first employed it. This treatment, however, requires dilitation of the duct besides the injection.

Among my brother Rudolph's papers, I found a report obtained from surgeons in this country some five or six years ago. (Producing the report.) Then the method was not so well understood, and still the results were satisfactory.

(The speaker then exhibited two instruments used in making the injections in the sinuses of the head.)

A CONSIDERATION OF THE PROBLEMS INVOLVED IN REMOVABLE BRIDGE WORK.*

BY KARL G. KNOCHE, D. D. S., CHICAGO, ILL.

Mr. President, Members of the Chicago Dental Society, Ladies and Gentlemen:

It is with a great deal of pleasure that I appear before you at this time; first, since it is my first appearance as an essayist before this society and, secondly, because I am to give you a few thoughts on a subject which is so alive today, so dear to me, and in which lies the promise of wonderful successes for the men who will go into it thoroughly and honestly. I believe removable bridge work to be of utmost importance as a prophylactic measure after the treatment of pyorrhea conditions wherever due to malocclusion and that nothing so thoroughly controls the results as does the placing of a properly made removable bridge.

My work has been entirely post-pyorrhea, and familiarity with the mouths of patients that were being treated and for which I have had to plan mechanical restoration which would right conditions, has been sufficient evidence of the fearful havoc wrought by work of every variety (crowns, inlays, fixed bridges, partial plates, produced in many instances by conscientious capable men). Much pointed and embarrassing comment has been made on modern dentistry as, for example, by Dr. Hunter, in his paper on Oral Sepsis, and while dentists could not suppress some resentment, a careful and honest appraisal of the facts, mortifying though they may be, proves that he was right in most of his contentions. Dr. Bush of Columbus has a few slides which he has named his silent clinic that speak volumes. They justify a multitude of accusations levelled at modern dentistry and should cause a feeling of shame at most of the work done by the practitioners. Dr. Chayes has repeatedly dealt with this subject and I will take the liberty to quote from his paper in the *Cosmos* (*Cosmos*, July, 1915, page 783, paragraphs 1, 2, 3 and 4). Despite the light which is spread by the newer dentistry many are still going in the same blind way and in the same old ruts. How often are fillings perfectly trimmed at the gingival? Perfectly carved to restore the normal occlusal contour, cusps, pits and fissures? Indeed, what proportion of dentists know the anatomy of the teeth well enough to restore the enamel lines of crowns or the shape and forms? Seldom are artificial crowns made that even resemble the natural teeth. They are slapped in on a rush, with strait sides, stamped cusps and, worst of all, with bands standing away from the gingival and irritating the soft tissue as destructively as does a sliver in the hand.

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*Read before the Chicago Dental Society, November 15, 1915.

Fixed bridges are in common use when both clinical observation and common sense often indicate that the removable type is a thousand times better. Operative procedures remain much as they were twenty years ago, notwithstanding the great incentive which the higher ideals of the day have given us. Most certainly many paths leading to a solution of our difficulties are open, and professional requirements as to prophylaxis and oral hygiene then will be consistent. This may seem to be a severe arraignment of practices that persist somewhat among the good as well as the bad and indifferent men, yet what I have specified are but a small part of what should be condemned out of the bulk of the most recent work.

If you could all see the botches that are seen every day, work done by all kinds of operators, you would agree with me that nothing is too strong to be said in condemnation of a system of practice in which lies so great a chance for ultimate failure, tooth and tissue destruction and ill health, as prevails too commonly today. What, then, seems wrong with the operative procedures of today?

It is partly because of too low ideals, lack of judgment, lack of skill and plain ignorance and I believe a large share of the blame falls upon our school systems. There seems to me, however, to be a remedy and that lies in the standardization of operative procedures that will be clear, definite and unmistakable in its requirements.

Let us consider, if you please, for a few moments the oral cavity: As dentists our first consideration is the teeth and what do we find there? And how does the average man approach them? Nature provided for a masticatory organ and decided that it should be made up of thirty-two units, of different shapes and sizes for different uses; the incisors, a prehensile unite, also used for biting off of food; the cuspids, the tearing unit; the bicuspids, designed to stretch fibers and tear them apart, to crack hard or brittle foods and to crush out the fluid portions of all foods, and finally, the molars, the triturating units of the organ, the very millstones of the mouth; but separate and distinct in form and individual in use as they seem to be, these thirty-two units make up the organ of mastication, and in the failure on our part to recognize this fact, lies the reason for most of our failure.

I believe one of the greatest reasons for mechanical failures is found in the neglect to study the mouth in its entirety as an organ. One tooth is treated, or several teeth, and it is felt that everything necessary has been done. In other words, the relation of dentistry to the mouth often is exactly the opposite to that of medicine to the rest of the body. Again, why regard simply the mechanical aspect of the work and never think of its physiological relation to the soft tissues and to the teeth involved? There are men today specializing in pyorrhea who have nothing to do with the mechanical restorations that are necessary in most of their cases, and who fail many times in their pyorrhea results simply because of their neglect. They refer a patient back to the man who, in the first place, did not believe himself able to subdue the conditions. Dentistry has many branches but only one trunk, and these men are practicing as if they grew in different forests. They are apart, instead of together, and lessen the chance for the best results, by a lack cooperation. We know that any disturbance in the mouth impairs its functions as a whole; the loss of a single tooth or the loss of the gingivae and of the alveolar process in pyorrhea, by making it impossible to cleanse the parts, impairs the function of the masticatory organ which then goes from bad to worse. We know that the digestion and proper preparation of food in the mouth is absolutely vital to its successful digestion in the stomach, and intestines; so any disturbance of the first phase means abnormal nutrition. Knowing this we must acknowledge that a preliminary to successful operations in the mouth and on the teeth, demands a general recognition of physiologic conditions precisely as in any other operation upon the rest of the body. This must be emphasized as the true foundation of operative dentistry; the necessity for all operations to be so done as to include "Extension for prevention," and the prevention of irritation or injury to the soft tissues; and to carry all this to an ultimate success means the application of correct mechanical principles. What I wish to emphasize in this: Every patient with an impaired masticatory organ presents a grave problem and one which has been regarded too superficially in the past. All factors that might enter into the truly successful treatment must have careful consideration.

I believe that malocclusion with its resultant, undue pressure, in an abnormal direction on the peridental membrane plays the most important part in the development of pyorrhea conditions. How often has the loss of a single tooth, the failure to properly separate teeth, resulting in the loss of normal contact, and many other things, brought about a malocclusion that resulted in an acute case of pyorrhea, which never could be treated successfully without the restoration of the occlusion.

A few words will suffice to give you my thoughts on malocclusion and its relation to pyorrhea. Malocclusion to me means any break in the continuity of the dental arches, for just so soon as we have a break we have an abnormal condition and a malocclusion. This break may be a cavity allowing the tooth adjacent to it to move forward and we then lose normal contact with the resultant pinching out of the interproximal tissues and a loss of what Dr. G. V. Black so clearly calls the alveolor crest. Unless the teeth are properly separated and a filling then inserted to restore the normal contour of the tooth involved we simply perpetuate the abnormal condition and we have ultimately a loss of interproximal tissue and so on. This break may be the loss of a single tooth allowing the teeth to tip and so producing stress in an abnormal direction on the peridental membrane and then the inevitable follows.

This abnormality may be an interference with the normal exercise necessary to maintain the health of the teeth. We find teeth under too great stress or too little. In the first place an inflammation is set up by the irritation and in the second we have a lowered vitality and lack of resistance due to improper stimulation. This break in the normality of the dental arches may be in the nature of uneven wear of teeth which must mean uneven stresses. This malocclusion may so often be the result of apparently well made fillings and inlays. The presence of fillings of any sort which are not perfect reproductions of the occlusal surfaces are sure to produce malocclusion simply because the flat surfaced inlay provides a fine surface for the patient to slide around with no place to lock and maintain the balance. One of the greatest faults found with fillings of all kinds is the usual total lack of the marginal ridges. They are usually provided with planes inclining toward the contact point affording every opportunity for food, to pack against the gum septum.

My one great objection to amalgam is the fact that for some time I have believed that many men shorten the bite somewhat every time they insert an amalgam filling by excessive trimming to protect the still plastic material. The nature of the material influences the operator to trim until perfect occlusion is lost.

One of the most valuable contributions to dentistry is Dr.

J. Lowe Young's work on the correct occlusal restoration. He arrives at his deductions not from an operative experience, but in his treatment of mouths as an orthodonist. He found that his own results were unsatisfactory in mouths that have had poor occlusal restoration. His work brings the lesson that by placing poorly made occlusal restorations in the pits and fissures of children's teeth, we may bring about a malocclusion that in after life results in the worst kind of pyorrhea. His preachings came home forcibly to me in one of my recent cases. This individual presented a splendid mouth, full set of teeth, large and strong with every evidence of having originally been in perfect alignment and occlusion. Present in most of the molars were large gold-foil fillings which had never been trimmed to restore the pits, fissures and ridges. All evidence of the original presence of sulci and ridges was gone and what followed these operations? The teeth instead of being locked by normal occlusion, began to drift until his upper six anteriors protruded to such an extent as to nearly prevent the closing of his lips. The lower anteriors had elongated and were striking the rugae above. The whole mouth was in an acute condition of pyorrhea with articular rheumatism neuritis, resulting primarily, I believe, from the malocclusion caused by these improper occlusal restorations. This one case and many others I could cite, shows the importance of an early comprehensive study of mouth conditions.

As to the results obtained by a restoration of the normal occlusion in post-pyorrhea treatment let me say that they are often startling. I have known many cases in which the instrumentation was simply palliative and of temporary benefit until the malocclusion was corrected and the teeth stimulated or rested, as the case might. So this subject becomes one of vast import and I am convinced that we as general practitioners, pyorrhea and prophylaxis workers, or bridge workers, need a clear knowledge of dental anatomy and especially that portion that deals with occlusion and its abnormalities even to a greater degree than does the orthodontist, if we are to serve the public in an intelligent and beneficial way.

This sums up my position on occlusion. I have gone into it so deeply because in most cases nothing so satisfactorily controls this problem as does a removable bridge.

Next in importance comes the irritation to the soft tissues of poorly trimmed fillings, food crowded between poor contacts, most fixed bridges, and last, and greatest offender, the shell or banded crown. I do not come before you to condemn all the work that has been done nor to condemn all fixed bridge work and say that nothing but removable should be used. I do not, for one moment, ask you to drop the one and take up the other. What I plead for are higher ideals, a better founding by our schools in the comprehensive study of mouth conditions and that we ourselves should become better diagnosticians and use our greatest discretion in the choice of our procedure and so insure better prognosis. I do most emphatically say that in extensive cases, fixed bridge work should have no place in our operations of today. Consider a case in which many teeth have been lost and a remaining few, through malocclusion, have become to a more or less degree, diseased, with the loss of the gingivae and part of the bony support. As those teeth stand, it is nearly impossible for the patient to cleanse them, and that alone induces the pyorrhea condition. With our higher ideals and better knowledge could we ever place in that mouth a piece of fixed bridge work? I, for one, could not, for I know that it would be utterly impossible to cleanse the mouth if it were already difficult to do so before, and that I would be signing the death warrant for the few remaining teeth to which anchorage was made; destroying instead of conserving them. I would instead place a removable piece, excising the crowns, fitting to the root ends a non-irritating cope and making use of the areas that permit of saddles, for that is what they were left for.

These saddles would be so placed as to insure against the abutment teeth receiving more than their individual load of the force of mastication, and with this piece of work I will surely conserve and strengthen those remaining teeth. The greatest harm done by fixed bridge work has, however, resulted not because they were fixed but from faulty foundations upon which they were built. We must depend upon our foundations for the success of any superstructure and the most popular foundation for our fixed bridge work has been the banded crown, or shell crown, that has been fitted to the abutment tooth. Allow me the privilege of withdrawing the word "fitted," since I have seen precious few that fit. My condemnation of the practice of banding teeth will be as severe as the results usually obtained by their application warrants, and that is extreme. More misery, more pyorrhea, ill-health, and even death from systemic conditions, has been produced by the irritation of bands than any other one thing in dentistry excepting the improper filling of root canals. These seem harsh and broad statements, but are borne out by clinical evidence and can not be refuted. It is absolutely impossible to fit a cylinder of metal, no matter how thin, over a conical shaped root and obliterate the margin of the cylinder. No operator, with any knowledge of cavity preparation, would think of finishing a filling to any but a margin cavity, and yet this fact is forgotten when preparing a tooth or a root for a band. Even though a band be wonderfully adapted, one little concavity unnoticed by the operator, in the root surface, at the margin of the band, allows this band at this point to stand off and here irritation begins its process of pyorrhea. However, I know that a few men place many, and more men place a few, bands that hug the tooth so closely at the gingival, as to produce little irritation and in some very resistant mouths, none at all. These crowns give valuable service. However, the rank and file, and they are in the vast majority, do not even approximate a fit to the root, and how many crowns of this kind are in mouths today very slowly but steadily and surely destroying the teeth to which they are cemented? They may protect the crown of the tooth and make sturdy abutments for bridges for a time, but they are a very decided, constant and destructive irritant to the soft tissue and Nature, through pyorrhea, in trying to get rid of the irritant, casts off the tooth with it as surely as it would slough out a sliver in the hand. If this were all we might still tolerate it, but it is not. How many of our physical troubles may be traced to some focus of infection arising from the irritation of this band, we do not yet know but we have had enough indication of them to make us fear their numbers. Therefore, a system of practice in which so great a chance for tooth destruction and injury to bodily health prevails, is wrong and we must seek something better.

I believe that failure in fixed work and its resultant condemnation by prophylaxis workers and investigators in both our field and in medicine is due very largely to the failure on our part to event attempt to restore the parts with anything that resembles the normal size, shape and contour of teeth. This again emphasizes the importance of dental anatomy. The study of dental anatomy brought about a clear and definite theory relative to caries; namely, "The Extension for Prevention" in cavity preparation, and I have hopes that with the great importance placed upon "Prevention" and injury to the supporting tissues, the profession will awaken to its great mission by a consideration of this same all-important subject (Dental Anatomy) in relation to its crown and bridge work.

This means simply that as extension for prevention became the standard by which cavity preparation was devised, so are we bridge workers in need of standards by which all work can be measured, and this will we be ever working toward our ideals. Dr. Orton, I know, will have considerable to say upon this subject and I feel that what he says will be a start toward the desired end, and we hope that before long we will be working upon a sane basis.

Bridge workers can aid greatly in this movement by lending their moral support to those who are earnestly trying to solve this problem and standardize this important branch of operative dentistry.

For my personal use in fixed work, where indicated, such types of attachment as the inlay abutment, the Carmichael abutment, and the shouler shell crown, have solved the problems.

Where Richmond crowns must be used, I have had to abandon the banded crown, which is old, but surely not honored, and a cope, swagged over the face of a root, is not strong enough; so that a technic for preparing the root with a bevel that developed a definite angle margin somewhere on the face of the root, had to be worked out. A few instruments had to be designed and then the attention to detail had to be given before a definite result could be obtained. However, with this technic, a coping can be made that never yet has produced one case of irritation to the soft tissue and which is as strong a support to the root itself as the band ever was.

Just a word in regard to the advantages of a removable bridge over a fixed one.

1st. From a hygienic standpoint there is no qualification of a choice. The fixed bridge is hard to cleanse and interferes with proper prophylaxis. The removable bridge is easily removed, easily cleansed, can be thoroughly sterilized if need be.

2nd. The abutment teeth offer little or no obstruction to the brush, tape, or Kuroris and can be kept in a high state of prophylaxis.

3rd. The abutment teeth are not immobilized as with a fixed bridge and to a large degree receive the same stress as is normal to them.

4th. We are able to use broad saddles and so relieve the abutment teeth of nearly all but their individual load during mastication.

These are the important reasons for the preference of the removable over the fixed bridge.

Now let us for a few minutes consider the principle involved in a removable bridge:

First: It should have a splitting action on the teeth to which it is attached.

Second: It should be entirely in the hands of the patient and not require the dentist's aid in removal and replacement.

Third: It should have broad, perfectly fitted saddles and these should be so placed as to apply to the anchorage teeth only their individual load during mastication.

Fourth: The work should be done with anatomical articulation, carried out to its fullest promise, for the indubitable reason that a disregard of this principle means ultimate failure.

Fifth: Provision should be made for tightening because of the likelihood that the parts will wear from the friction due to removal and replacement. Therefore, there must be adjustable or replaceable parts. To quote:

"The above meet all requirements and still allow a broad latitude for excellence of mechanical workmanship and esthetic results. The working out of these principles I will endeavor to show you with the help of slides, but I wish to speak now of saddles and dispose of the statement that resorption takes place under them. When properly made and adjusted with relation to its anchorage a saddle provides the soft tissue and bony ridge with the exercise and stimulation necessary to prevent resorption. Resorption of the tissues does not take place under a properly fitted saddle. How is this to be obtained? Take an impression with modeling compound and *never* trim the model obtained from that impression. I thoroughly condemn the trimming of saddle models because mere man cannot have such a knowledge of the tissue as to determine just where and how much to trim. In fact, whoever has such knowledge is of divine nature. Seriously, it is owing to our having trimmed models for saddles and so applied pressure unevenly (which means wrongly) that resorption has followed.

Tissues must be stimulated by exercise and they must be free to satisfy their need, or they will undergo atrophic changes. Therefore, anything that interferes with the unrestrained freedom of stimulation to the soft tissues will bring about pathologic conditions, a diminution of vasomotor action and finally an atrophy or loss of tissue resulting in resorption. Therefore, I say that that no model should be trimmed, which may cause an uneven pressure upon the tissue and interfere with proper and free stimulation, and I feel that saddles made as I have outlined and placed in a like manner by their very action provide the exercise and stimulation necessary to prevent resorption.

In order to place a saddle in the right way, force it hard upon the ridge, blanche the soft tissues, applying a force equal to the full force of mastication, and in that relation attach it to the anchorage crowns. This saddle will be driven tightly to place under the full force of mastication, and its pressure will be relieved slightly, owing to the elasticity of the connective tissue when that force is removed, creating a pumping of new blood into the parts, stimulating and invigorating the tissues involved, and so preventing resorption.

Let us consider the forms of attachments or abutments. The most important step in the preparation of an abutment is the careful and exacting treatment of root canals wherever the pulp is involved and where reference is made to abutment it will be understood that the root canals have been sealed after the Calahan method. (I realize that the way in which I have disposed of these canals is a very convenient one.)

I will divide the abutments and their attachments into anterior and posterior. The anterior attachments that stand out above all others are the coping and tube with split pin, the lingual inlay and tube with split pin, or an artificial crown carrying some slot or sleeve to receive a split bar.

I care least for the last since the crown attached to the root does in a measure interfere with perfect cleansing, while the cope and tube offers no interference.

For the posterior abutments in removable bridge work we have the telescoping crown and this may carry with it a tube and split pin or slot and split bar, or it may be an inlay having a slot or sleeve to carry a split bar or lock, or it may be a cope with an extension tube carried into one canal, or into the pulp chamber and supported by a boxing of gold to take up the lateral stress.

The first form, the telescoping crown, I do not care for owing to the probability of the band irritating the soft tissue, and of them all I prefer the last which I have worked on a long time and am very well satisfied with. It presents strength and still not enough bulk to interfere with cleanliness.

On approaching a case I believe it is absolutely necessary to have correct study models. These should be carefully made so as to duplicate existing conditions. With these a careful study of the case may be made and only then should such a restoration be undertaken which affects the occlusion or the relation of the teeth one to the other.

After a comprehensive study is made of conditions it is necessary that the requirements emphasized by modern dentistry be fulfilled. These are, that all operations be so conducted as to leave the mouth in the most favorable condition by the prevention of recurrence of decay or injury to the soft tissues.

Root preparation: The first step is the excising of the crowns which is done with long tapered fissure burrs. The stump is stoned down to the proper relation to the soft tissues, leaving the lingual high, and then the enamel body is removed. This operation leaves a slight bevel on the root which is accentuated to an angle generally of 45°, and is varied as the stress the root is to be subjected to varies. This margin of this bevel in all normal cases where it extends under the free margin of the gum should follow the original enamel line so that the coping when finished to it affords a step in the reproduction of the enamel body, which is very essential if we are to conserve the soft tissues.

This bevel is produced with burrs designed for that purpose and which allow a minimum of injury to the soft tissues. With modeling compound in a Roach cup that has been fitted to the root an impression is taken which gives us a well defined impression of the angle margin developed. This is then poured in plaster and the model then trimmed.

This model is oiled and plunged into the dental lac cup of the dental lac and vulcanite swaging apparatus. A sheet of 36 gauge platinum is then swaged into the dental lac counter die and trimmed to length. This method gives a coping a little small which must be stretched over the root end instead of burnished down to it.

While these are being made in the laboratory the paralleling of the roots that are to receive tubes is being carried out.

In regard to instruments designed for that purpose, let me say that the Parallelo drill appeals to me as a decided menace in the hands of the inexperienced operator since it is the easiest thing in the world to disastrously perforate the roots of teeth. I much prefer to work slowly and carefully and be sure of every move I make in this operation by the slower method of working it out in the following manner. The Parallelo meter of Chayes, or the new and, I believe, more convenient instrument of Weinstein's is used. The mandrels are placed and spaced so as to center the opening of the canals and then the proper tubes are slipped over the mandrels. The drilling is commenced by removing the root canal filling to a certain depth and then enlarging the orifices of the canals with fine cutting burrs. The cylinders are then painted with black lead and inserted as far as possible and where they bend a black spot is left which is cut away with the burr, and this is repeated until the tube is carried as far as possible into the root. The orifice is now beveled with a large reamer, the copings placed and tubes driven through them, care being taken to burnish the cope at this time to the beveled orifice. The tube and cope are waxed together, invested and soldered. The depression of the coping engaging the beveled orifice is filled flat with solder, which makes a stronger solder point and allows a slight beveling of the orifice of the tube so the split pin will subsequently slip into it easily.

The coping with the tube returns to the root and is malleted, and burnished and trimmed until it is burnished to the root and the periphery of the coping is flush with angle margin on the root surface. This last is the most important. The margins of coping and root are trimmed and burnished just as any filling is finished and the joint obliterated. The coping is now reinforced for strength. The under surfaces are painted with an anti-flux and just enough investment to fill up the under side of the coping.

Strips of solder are then placed along the bevel and sweated to the platinum until the desired bulk for strength after trimming is obtained. The copings after reinforcement are placed on the roots, an impression taken in one of the self-separating impression plasters and removed. The impression is painted, the pins or tubes waxed to facilitate their removal from the model and the under side of copings vaselined. Care must also be taken to fill undercuts between plaster and copings for a reason I will later explain.

For a long time I felt discouraged with simple plaster or Spence plaster for models since the removal and replacement of the copings frequently meant mutilated root reproductions, either necessitating many impressions or resulting in ill-fitting work, and finally the use of amalgam was thought of. This is made of an alloy manufactured by Dr. P. J. Kester, whom you all know, and serves the purpose admirably. This is packed under the copings and cone is built up around the tube or post and roughened to give the retension in the plaster. This is allowed to set and the rest of the model is poured in Spence plaster or Weinstein's artificial stone. After the impression has been removed from the model the bite is taken following the method for anatomical articulation and the case mounted.

The teeth are selected and ground to place. These are then waxed securely in position, the labial surfaces are oiled as well as the model and a mass of plaster is worked over the model and against the labial surfaces of the facings. This is allowed to set and is removed. This plaster becomes a matrix into which the facings fit and which when placed in position on the model holds the facings in exactly the position we waxed them up in and allows working from the lingual freely.

The split pin is made of one-half round elastic metal which is very tough and has none of the objections of clasp metal, namely, brittleness, and it is preferable to iridio-platinum since the same metals of equal hardness wear faster when in friction one with the other than do different metals of different hardness, as is shown by machinists when making bearings, and as Dr. Roach discovered when he made his attachment. Therefore, since the tube is made of iridio-platinum I use the elastic metal which in reality is a new clasp metal for the split pin.

Metalurgy of elastic metal: Alloying of platinum and gold and copper—not in all proportions. Palladum and gold alloy in every proportion, etc.

The pin is fitted into the tube, and is roughened as far as it extends beyond the tube so as to hold firmly in the wax. The coping and model are oiled as are the facings. Of all oils used I prefer cocoanut oil which is a splendid lubricant and is very fluid when the hot wax is poured against it, and is easily removed with the ether and alcohol spray to which the wax is later subjected. The wax is melted in a pan and is poured between the cope and the facing just so as to insure getting into that area. The crown contour is then built up and the wax allowed to cool until solid, when pressure is applied to the still soft wax to set the molecules which are still in motion. The wax is allowed to cool at room temperature, the plaster matrix removed and the wax carved.

The facing is removed by aid of sticky wax applied to the labial, is replaced and the wax and split pin are carefully removed from the coping. This removal of facing and coping from the wax and their replacement is done several times. This works out the shrinkage of the margins of overlapping wax due to its elasticity. If the lubricating material be allowed to remain it globulates and gives us an imperfect casting so it must be removed and somewhat of a problem arises. It has been my practice to wipe it off with a brush and alcohol, and while alcohol will not dissolve the oil it aids in its removal. However carefully this wiping is done, you are liable to, and I feel always do, drag your wax in the slightest degree and so have an imperfect result. I use a means whereby I can etch the surface of all wax patterns so as to have the investment take hold instead of run off of the wax. It was my idea to etch it very slightly as a porcelain inlay is etched for setting and still not interfere with it in any way and not drag its surface. The best way I know of to do this is to use two-thirds alcohol (grain) and one-third ether in a vaporizer or atmoizer, and spray with this mixture. This bombards the wax with minute particles of the mixture, etching the surface and at the same time removing the lubricant.

Owing to its rapid evaporation and consequently chilling action on the wax I felt it would again have a tendency toward shrinking the overlying wax margins, so I allow this wax to set in room temperature for a time before investing.

Now as to the control of shrinkage due to contraction of gold in crystalization. This is a problem with which I have struggled for a long time and I have finally concluded that the only way in which to cope with this problem is to attempt to compensate for this shrinkage by expanding the wax as it is invested and keep the wax expanded while the investment is setting. This is accomplished by the use of an apparatus such as bacteriologists use to keep their cultures at a given temperature and which is really an incubator. It is controlled electrically and though I felt I would be able in this paper to give the complete tables of the heats, etc., that I am using, I have not as yet decided upon the exact heat that will give absolute results and I am now checking back to find just where I am at. However, I believe the heat that will best expand the average size pattern to compensate for shrinkage in Ney Oro casting Gold B which I use for all bridge work, is between 112° F. and 120° F., probably closer to 120° F. or about 117° or 118° F.

To this detail of technic I attribute my success in making all of my castings fit accurately.

When my wax pattern is invested and being prepared for the casting machine I sink the coping into moldine deeply so I can pour into the moldine and under the coping a low fusing metal that fuses in boiling water.

When the casting is made and any bubbles of gold which may be present trimmed off, the casting is placed on the coping which has a solid metal base and so can not be distorted, and if it fits snugly it is driven down with a few light mallet strokes and then removed. At this time the gingival contour is taken care of and the margin of the casting is disked to the coping and is ready to be waxed, invested and soldered to the adjacent casting. I prefer to make each unit separately and solder them singly to the next unit and so around.

In a complicated case where the fit and adjustment is so perfect the soldering of the parts becomes quite a question and one that has been overlooked to a large degree. I believe it absolutely essential to have an expanding investment both for investing the wax pattern and for soldering. For that reason I use a mixture of Taggart's one-half which in my bands shrinks appreciably but is of fine texture, and Ridonts' one-half which is coarser, harder when set and expands. This gives me an investment which fills the ring at all times and I believe is responsible for my success.

In soldering I use the straight Ridonts mixed with warm water, thereby relieving the tension of the hard sticky wax that I use, and begin drying as soon as possible. Solder as soon as dry and as quickly as possible and cool in the block. Of course, the common laws of soldering are observed, namely, clean parts, parts in contact and equal distribution of heat.

There is one other feature of the work I'd like to mention, namely, the setting of facings. This is a matter that I have had trouble with and one on which I am now very positive. I set all facings in Pinches crown and bridge and my only objection to it is that whenever I want to remove one I have difficulty in doing so. I have boiled them for hours in the different acids with no result and the only way I succeed is to imbed the case in investment, heat it thoroughly and then boil in 50 percent hydrochloric acid, and then sometimes I get them out.

A few slides are all I will show, since I have taken so much time as it is, and there are others to follow.

You may have been bored by the mass of detail I have given you. But, ladies and gentlemen, it is only a small part of the detail necessary for complete success. Dr. Owre, Dean of Dental Department, University of Minnesota, has a formula for success or its degree, which is, "Attention to the Minutiae and Details." It was his motto that the degree of success is in direct ratio to the amount of attention to minutia and details given.

In order to forestall one point that will arise in the minds of a great many practitioners and is likely to be made in a discussion, I will quote from a paper by Dr. Henry W. Gillett, of New York, read before the Northern Ohio Dental Society last spring, in which he said: "I desire to forestall here one point that is likely to be made in discussion, namely, that the full accomplishment of what I am about to advocate is possible to only a limited portion of our clientelle, and of the practitioners of our profession. This I unhesitatingly acknowledge as a fact, but I hold it to be an ineffective argument as against the wisdom of formulating and advocating the most efficient plans possible for the attainment of the desired end.

"I also further reply in advance to this mythical critic that he has no means of knowing how our clientelle will respond to a need once it has been made clear to him. I predict that when the dental profession or its active third, finds itself and is able to say, with that assurance based upon certain knowledge of fact, which invariably carries conviction to the hearer, 'Your continued health, even your life, depends upon the elimination of these ill conditions and the establishment of a better state of affairs;' then there will be the same acquiescence from them as in the case of the surgical operation necessary to continued life and health."

Let me close with Dr. Owre's formula for success and its degree. Success or its degree is in direct proportion to the attention given the minutiae and details.

PRESIDENT'S ADDRESS. OUR OPPORTUNITY.*

BY DR. W. C. M'WETHY, DIXON, ILL.

Fellow members of the Northern Illinois Dental Society:

It is ten years since I became a member of this organization. In that time I have missed but very few of its meetings and only then because it was impossible for me to attend.

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*Read before the Northern Illinois Dental Society, October, 1915.

As for ever being chairman, such a thought had never entered my mind and, when called upon, it was with the utmost surprise that I heard the announcement. I assure you that I appreciate the honor, and cordially welcome you to this, our twenty-eighth annual gathering of the Northern Illinois Dental Society.

In bringing to you the customary President's address as becomes my duty at this time, one's first thoughts turn to the very capable ones who have preceded him. But rather than wishing for the opportunity that others have had, it needs only a moment's meditation to recognize the wonderful opportunity this 20th century history-making age is giving us.

For fifty years or more the dental profession has been waiting for this opportune moment. I wonder now how generally the profession as a whole will take advantage of it. How in vain our predecessors tried to teach the dangers of the unclean mouth, but alas, only until within the last three or four years has even the medical profession been willing to acknowledge the real importance of Oral Hygiene, and with that acknowledgment the call comes stronger than ever to every member of the dental profession to keep abreast of the times and be prepared to defend himself and patient against the needless destruction of teeth that in reality have no detrimental systemic effect.

No doubt many, if not all of you, have already met with the jumped-at-conclusion case, or the case where not knowing what else to lay the seat of trouble to, the medical advisor decides that certain teeth are the cause of all the trouble. Here is where our test comes in. Whose word is to stand as law, the medical advisor or the dental advisor? If we are convinced that there is no infection let us prove our position by use of the X-ray or bacteriological laboratory, and at our own expense, if need be. Such proof as this will do much to elevate our profession in the minds of the public.

Jumping at conclusions, brings before us the rampant headlong rush the profession, and the world at large have taken after the emetin treatment. An article appeared a few months ago, written by an Ohio M. D. of more or less note, in which he goes on to say that "A few hypodermic injections by your family physician or dentist will make your old loose teeth, tight and solid." After carrying the people to such a mountain top and leaving them there, just at the close, in a very obscure way he remarks that it is well to have your dentist give the teeth their usual cleaning.

Such eminent authority as Dr. Evans has written of the value of Ipecac as a mouth wash, as a means of prevention for pyorrhea and sore gums. Perhaps the solution does have merit as a mouth wash, but very little, if any, more than a dozen other astringent washes, for in 99 cases out of 100 if there is no irritation there is no inflammation and thus no need of a mouth wash.

But, however, the point is, that it resolves itself to the same old patent medicine idea, that cures everything from bed bug to rheumatism. Our opportunity is here, the people are talking, reading, thinking, and it is the duty of every member of the profession to stand pat, and be prepared to set right these erroneous ideas in the public mind at every available chance, and thus prove our professional ability to properly advise those who come to us for advice.

Not only in the case of pyorrhea and emetin is this true, but there are I believe many of our profession, who need a general awakening along the line of taking for granted everything that is written without giving it their serious thought and study, e. g., there is a local anesthetic on the market, which is strongly advertised for its anesthetic properties, which is all very true, but in its formula Quinin comes in to form a part of the compound and wherever Quinin goes hypodermically, sloughing will follow with very few exceptions. Yet there are men using that solution without giving the formula a thought or even looking it up, but taking the advertiser's word for it. In fact these advertisers are getting so accustomed to putting their stuff over on the profession that they have become very bold and have assumed in some cases the role of a dictator.

If you will pardon a personal reference: A salesman in my office but a few months ago, was trying to sell me a certain brand of amalgam. I informed him that I was using that which had stood scientific tests as well as the test of time, and was not in the market. He began at once a line of talk flattering my ability, to tell just by the mixing, what the quality merit of an alloy would be.

On the spur of the moment we would almost admire his nerve to enter upon such ground with practically no real knowledge of the minute detail of making and perfecting an alloy worthy of recognition by the dental profession, but alas, is it not a reflection upon our profession that even the most ignorant do not know that in order to have their wares accepted by us that they must not only be worthy, but show the proof of their worthiness?

Every amalgam upon the market should show the quantity of alloy and mercury in definite and unmistakable terms or we should not use it. One of our standard amalgams on the market now, and put out by an old reliable dental manufacturing firm, has its mixing formula given as 9 to 11. Nine what, to eleven what? It does not always follow that mercury is the larger portion and what is more, we are no longer guessing, we have passed that stage and if the manufacturer does not take interest enough in his product to know the proportions of mercury and alloy that will make the most perfect filling, then surely it is unworthy of our consideration. Especially is this true in the use of amalgam, when such a large portion of our fillings are made of this material and what perfect and serviceable results can be attained by using care and exactness, while such wretched results can be attained from it by neglect and inferior quality.

The opportunity is now here, the gates stand ajar, ready to be swung open. The public is more ready than ever before to receive and appreciate good service. The foundation laid by our predecessors has been well laid, and to us falls the privilege of continuing the structure toward that completion, which ends in exactness and perfection.

Only a few years ago we would have thought it impossible for anyone to select that most tedious of all dental operations, the treating and filling of root canals out of which to make a specialty, yet today we find it an established practice. It is to the organizers and workers in societies that we owe our gratitude for the opportunity that is open to us.

This Society, though not a part of the State or National Association, has done its part and numbers among its past and present membership many of those eminent in the profession.

We need not be backward in urging our friends to become members, for the benefit that they can receive and impart. I cannot refrain just here from mentioning the value of the National Dental Association, which comes free with membership to the State Dental Society. The reports from the Research Department alone will repay more than the total membership expense. No practitioner can afford to permit these opportunities to pass unaccepted.

The law committee of the National Dental Association has been working for the past three years upon a plan to protect its members against illegal malpractice suits. Their plan is to collect by means of the regular membership fee without increasing the fee more than a trifling amount. This matter is of vital importance, for none are immune. Inasmuch as this is a step forward in professional organization and advancement it seems fitting that this society should pass an endorsement of the work of that committee and forward it to Doctor C. B. Warner, of Urbana, Illinois, the committee member of this State, also urging the completion of their plans even at a greater cost than the minimum, which they have anticipated.

Fellow members, is it not the psychological time to campaign for new members in this Society? Our membership should be increased 25% this coming year. No practitioner in Northern Illinois can afford to be without a membership in this Society—the most friendly, fraternal, and homelike of them all. Any one who will join with us the third Wednesday and Thursday of October of each year will soon know us and be known by us as one of our Northern Illinois family.

PROCEEDINGS OF SOCIETIES.

MINNESOTA STATE DENTAL ASSOCIATION, THIRTY-SECOND ANNUAL MEETING HELD AT MINNEAPOLIS, JUNE 11, 12, 1915.

DISCUSSION OF THE PAPER BY DR. W. H. G. LOGAN ON "DIAGNOSIS AND PROGNOSIS OF THE MORE COMMON PATHOLOGIC CONDITIONS INVOLVING THE DENTAL PULP AND PERIAPICAL TISSUE."*

Dr. C. N. Johnson, Chicago:

Mr. President, Ladies and Gentlemen: First I must permit myself the privilege of expressing my great appreciation of the pleasure of meeting with the Minnesota State Dental Association again. I feel at home here. It has been my privilege, on previous occasions to meet with you, but not in recent years; it does me good to come to this neighborhood, and see old, familiar faces, and meet new ones. The most significant thing about these meetings, to me, is the increasing number of new faces that are coming into the association.

Now, Mr. President, in regard to the discussion of this paper, I must confess that I wish it had fallen into better hands to discuss some of the ideas Dr. Logan has brought out here. When I was first approached about coming to the meeting to take part in the discussion, the subject given me was not along quite the same lines that Dr. Logan has talked today; and I was given his paper for the first time last night. I was impressed, on reading that paper, with the fact that the rank and file of the profession should give more attention than they have in the past to the clinical findings, to the pathological symptoms and to the general factors which affect us in our decisions in the management of the pulps of teeth when they become involved. Because, at this particular time in the history of the profession,—I do not know how it is here, but I do know that in our neighborhood and in other vicinities—the question of pulpless teeth is one of the most vital that we have to consider today.

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*Dr. Logan's paper was published in the January number of the Dental Review.

That brings up the other question as to whether we shall try to save pulps or destroy them. I believe in Dr. Logan's presentation of the symptoms that should govern us in our decisions as to whether we should destroy or try to save pulp. I believe that that is as clear cut a statement as I have ever heard. I believe that with these influences at work we cannot yet say decidedly when, in all cases, a pulp shall be destroyed or saved. But I do say this: In future, if we are going to serve our patients to the best advantage, we will have greater care for pulp than in the past. In other words, we shall not attack a tooth in the human mouth, and simply because it has a pulp that we suspect, knock that pulp to death. We have got to have some reason for killing pulps, after this.

This question is now coming before us, and it is looming high on the horizon of the future of our profession; and if we are going to give our best service, we must know when to destroy pulp, and when not.

In this connection, I will say that I do not believe there is a man in the profession today who stands ready to destroy pulp, as has been done in the past, as a matter of mere expediency. There are other things to be considered. We should consider the ultimate result of the destruction of the pulp. No man destroys a pulp, or enters the pulp chamber or canal, without causing a situation which may become serious. I would not attempt to elaborate on the symptoms as the guide by which one should be directed in his attempt to save a pulp, or in his decision to destroy it; but I will say this: In one part of the paper Dr. Logan mentioned something about the results of pulp destruction, and I expected to dwell a little more on that,—the possible outcome of the saving in the mouths of people of pulpless teeth. I expected to talk more about that than the living pulp. You know there are cases where we find the pulp already dead, or in such a condition that it must be destroyed; but whether we shall try to save teeth after the pulp is dead, or not, seems to be the question. There are some members of the medical profession, and I expect there are some members of the dental profession, who are soberly demanding today that if a tooth has lost its pulp, it is dangerous to leave it in the mouth. We ought to consult about that a little bit and reason about it. It is true that in the past very much injury has been done to patients by leaving in their mouths pulpless teeth that cannot be made healthy. It is true that the medical profession has a basis of argument when they say that local foci of infection in the mouth from pulpless teeth have been a menace to the individual; but to say that every pulpless tooth is a menace to a patient, is a reflection upon the profession of dentistry for the last fifty years. And I, for one, do not propose to stand and hear the dental profession reflected upon in that manner.

I wish we had the time to go into the details of this question, and refer more fully to the clinical aspects. You and I have seen teeth in the mouths of individuals, which have lost their pulps for forty years,—still doing good service, and they have not killed the patients. Now, if it is true that a pulpless tooth is always a dangerous thing in the mouths of people, I want you to stop and consider the number of our citizens all over the country who have been dangerously ill for many years, and did not know anything about it.

We want to approach this question in a proper way. Let us listen to everything that is told us about the danger of infection from the apices of the roots of teeth. I do not believe there is a man here, practicing dentistry, who would willingly jeopardize the life of his patient; but if we are going to keep on with the wholesale extraction of teeth, we are going to leave our patients limp and lame and helpless. All should recognize the fact that there are many cases of infection which prove serious, and you and I should devote ourselves more carefully and thoroughly and conscientiously to the management of these cases when they come to us,—because pulpless teeth will come. We want to improve our technique,—every one of us; we can all improve our technique in the management of pulpless teeth. We should think more seriously about the problem, we should give the patient the benefit of the best service that is in us; but let us not, in the face of this problem, throw up our hands, and permit our patients to be imposed upon by the extraction of all pulpless teeth. Dr. Logan has tried to point out those cases by which, with careful management, the pulps could be preserved alive; he has tried to bring out the facts about those cases where he does not believe it is best to preserve the pulp alive, and where the pulp must be lost. We must improve our work and give better service, if it can be done.

Now, I am willing to stand up before this audience, and announce that I cannot fill every pulp canal to the end. I have heard men claim that they can do it, but they are better men than I am if they can. I made that statement in a paper that I read last month, and a strange thing happened. I wrote it one night, and the next morning I opened my desk and picked up a tooth that had the crookedest root that I ever saw in a tooth, and how it came into my desk, I never knew. I have the tooth here, in my pocket,—here it is—and if you will put that in a human jaw and let any man radiograph it and clean the canals out and fill them to the ends, I would almost be willing to attribute to him the function of a deity. I know I could not do it.

We can do very much better technique than we have been doing in the past, and we must do it. We can fill many canals now that we could not, before; and I believe, as I have already said, that our relation to this question should resolve itself down to a careful study, and that you and I must go home and consecrate ourselves to attaining a better technique, in order that our patients shall not be jeopardized by careless operations such as you and I have seen and have possibly performed. We must consider the welfare of the patient and do our utmost to stand between the people and that kind of criminal malpractice, which urges the extraction of all pulpless teeth.

Dr. J. M. Walls, St. Paul:

My talk will necessarily be somewhat extemporaneous. Dr. Logan, in his modesty, neglected to tell you that he had been giving a lecture, and that the lines ran so closely to the paper of last evening, that he decided at the last moment to make a paper which would touch on another phase of the subject and consequently, I have not had much opportunity to go over his paper.

I am glad Dr. Johnson took the position of "driving the ambulance." I think he would pass very well as a registered chauffeur. I am going to confine myself to the other side of the subject,—to the "building of the fence" along the cliff.

For eighteen years I have been making records of teeth that have been filled, the character of the filling, the apparent depth of the filling, and the protection of pulp where protection was made. I thought recently I would go over my records and determine in a more definite way than I can give at this time the findings that would be revealed by these records. I concluded to make these records, from the fact that at the beginning of my work in the practice of dentistry, I found the stumbling-block Dr. Logan has referred to. In teeth where the pulp is possibly involved, how are we to guard against disease and the ultimate death of the pulp? Dr. Logan has referred, in the first class of symptoms, in diseases of the pulp, to those cases where we have short paroxysms of pain following a known or definite irritation. This would confine the question largely to the class of teeth that have been filled, and consequently the result of this hyperemia is due to the irritation from the metallic filling. Have we not placed metallic fillings too close to pulps? Have we safeguarded our pulps sufficiently well, by cutting our cavities deep and condensing gold or amalgam into those cavities without due protection of the dentin? I believe not. And it is with this particular point in view that I wish to discuss the question.

It seems beyond dispute that the cement which is being so largely used, is more or less irritating to pulp. This is a somewhat mooted question. The fact that cement is not susceptible of thermal changes, we know. Therefore, its use in the protection of pulp from irritation, might be taken advantage of. In order to guard against irritation by cement, we can use the rosins which seem to be practically non-irritating, and varnish. The use of gum in this way, not only where cavities have been prepared in teeth, but where they have been cut down, leaving the pulp in a tooth, where teeth have been cut down for crowns, not only gives the patient immediate comfort from the pain, but I believe it goes a long way in saving the pulp from ultimate death.

I agree with the author so fully in the contents of this paper, that it would seem only repetition for me to go over the different points and discuss them. He has so ably taken up the etiology, the diagnosis or prognosis, that it would be useless to dwell further upon these features.

It is well recognized, perhaps, by the older practitioners that the condition of the individual has a great deal to do with the possibility of pulp saving; so that, when we have pulpless teeth, we must take into consideration the health and age of the individual. What are the circumstances that would require the removal of a pulp where caries has penetrated into the dentin? is a question that comes up to the practitioner, daily. How much of the caries are we going to remove? When have we gotten to the end of the caries and into the disorganized dentin,—the decalcified dentin? Are we to remove all decalcified dentin?

It is fully recognized that the pulp shows a change in condition with any irritation from any cause; a slow process of irritation,—that of abrasion of the teeth,—is a factor we have to deal with. Ordinarily we find in advanced life, where people have worn their teeth down badly, the pulp has receded, as the advancement of attrition went on, so that we often have a natural filling in of the pulp chamber; and in many instances, we shall find that the pulp has been entirely replaced with secondary dentin. We also find instances where there is recession of the pulp, and this gradual attrition has come closer and closer to the pulp, until it has finally exposed it, and the resultant irritation has caused the death of the pulp. So we may find in some individuals a change or variation in the consequent condition of the pulp from irritation; and where you would protect a pulp in one instance—that pulp would throw out secondary dentin, a natural protection,—in other instances we would have no secondary dentin deposit.

I wish to emphasize one point in this respect that Dr. Logan spoke of; and that is the necessity of recognizing the conditions where we would most decidedly remove pulps,—where we have the best opportunity to do it, under aseptic conditions, not waiting for the death of the pulp, not waiting for disintegration or sepsis to set in; but where the caries have been extensive, and we have every reason to believe that the excessive extent of caries would lead to such lowered vitality of the pulp that it would be fatal to fill or crown that tooth. Now, I am convinced that most of these cases come back later, and require the treatment that should have been given them at the earlier stage.

We find in our practice another factor which leads us to a consideration of the handling of pulps where they have been diseased,—and that is, the age of the individual. How frequently we find cases where teeth have been involved, where they have been filled or crowned, and where the patient has passed through a period of stress until he has been attacked by systemic trouble, and has reached an age owing to which and owing to lack of proper care, where the vitality is lowered; and then we find the trouble with the pulp is quite possibly due to this same lowered vitality.

Reference was made to the capping of pulps where the tooth was not fully developed. I regret that the essayist did not say to you what he said to me, regarding the fillings at the ends of children's teeth, after the pulps had been exposed. Possibly he will bring it out in closing the discussion. Under those circumstances, where we hope for a further development of the tooth, it seems good practice to cap the pulp rather than open into the pulp chamber, remove the pulp and fill the roots.

Another case of conditions which seem to me applicable for capping, that is, where the exposure of the recessional line of the pulp reveals that the pulp has receded some distance beyond the point of exposure; the irritation is sufficient so that the pulp draws back, and we have a space between the point of the exposure into this canal. This recessional line does not close up. Under those circumstances, we might be successful in capping. Under other conditions, I think it is fatal to attempt to cap a pulp.

The filling of roots has been so well covered last night and today that I can only refer to what I think is an impossibility in the majority of cases,—that is, having any assurance whatever of filling perfectly the majority of the roots with which we have to deal.

I was glad to hear Dr. Johnson speak so vigorously as he did regarding pulp destruction.

We have no radiographs, of course, which show the results of root fillings for a great many years, and it would seem absolute folly to me at this time to take the stand that we should extract all teeth where the pulp has been removed. We must perfect our technique, bring it to a higher standard than we have up to this time, for the filling of root canals. When we consider the anatomy of the root, the irregularity of the roots, the inconsistency of the form of roots and root canals, it makes us feel that we are very uncertain, even through the use of the radiograph, of perfectly filling any roots. Those of you who have seen the work which Dr. Grove presented at these meetings, showing in almost all the cases which were, I believe, picked at random, not selecting instances, where he showed us the condition at the ends of the roots,—showing the cross canals, the cutting of the main canals, running through the root;—you will have noticed that there were many cases of that kind.

There were some other points I had noted to discuss, but I feel that they were so fully covered by Dr. Johnson, that I do not care to go into them now.

Dr. L. P. Leonard:

I think perhaps a word along the line of experience, might be all right stated in this connection.

Now, we know that the question of preserving pulps and filling root canals is in a peculiar condition today. It is sort of up in the air. I want to give a word of experience which has extended over thirty years. I kill more pulps today than when I first started to practice, and I have less trouble. I believe that a pulp should be handled a good deal as an essayist once said about a young lady. He was asked whether a gentleman should kiss a lady, or not, under certain circumstances, and he said that he thought the lady was entitled to the benefit of the doubt, and where he was doubtful, he would kiss her. And I would reverse that and say that if we are in doubt as to whether a pulp should be killed, or not, we would better kill it; we will have less trouble.

I wish also to state that I do not believe in over-treating. We must have a little confidence in nature, and if we do not over-treat teeth, I think we will save some which are being over-treated today and lost.

Dr. E. C. French, Eau Claire, Wis.:

The paper was an interesting one, and every point, I think was clear to all of us. The action of a tooth is a very curious thing. You can tell all about blood pressure and circulation, with all the ramifications, but you never can tell just what a tooth is going to do.

I agree with Dr. Johnson fully in what he says in regard to filling the root canal. To go back, now, some time in 1884 or 1885, I was down at Kilguth, Iowa, and there was a doctor there who gave me some canal filling, and I don't remember the name of that. I saw him demonstrate on a case, and when I got to his office he asked me if I had ever seen any of his copper canal points for the filling of teeth. I said No. I thought it was a strange thing that a man should be filling teeth with copper. However, I took some of these copper canal points, and I have only one criticism to make of them, that is, that they are too fine for general use. There were a few of them put before the profession, but I have never found a man since then who has ever used them. My mind has reverted back to my use of them, twenty-five or thirty years ago, and I don't know but more, and I have tried in vain to recall, time and time again, a single tooth that ever came back to me, that had had one of these copper fillings in the canal. Just stop and think. Doctor Ames, when he came out with "copper sodium," he claimed that copper was a preserver of the teeth, and we know that it is; we know that copper is a germicide. You can put those little copper canal points into any place in the tooth where you can get anything else; they are soft, and by putting a little gutta percha on the end of them, you can work them into a crooked root. How near you would get to the end, I do not know, because I have never seen it. I have some specimens in my office, about as crooked teeth as any ram's horn; two of them I filled with a white metal that somebody got up years ago,—we would put in a tube of phosphoric acid, and how they would sizzle and burn —not the patient,—but it would kill the microbes. I would like to get someone who is making canal points to make up about three sizes of copper canal points. I think we would have less trouble than with gutta percha, or rosin, or anything else.

Dr. T. B. Hartzell:

You know, when the Irishmen get at us, we always get something, and my friend from Chicago has handed us something today. Whenever I go to Chicago, I go to his office, because I get something from him; he has the goods, and he is always willing to divide. Knowledge is something, which, the more it is imparted to others, the more it enriches the giver, —and by this measurement, my Chicago friend is rich, indeed.

I was delighted that Dr. Johnson should voice my sentiments exactly, and I want to add one little thing to this discussion,—that in the analysis of the hospital records for two years at the University Hospital, made by Dr. S. Marks White, in a paper contributed to the New York State Medical Society, he found, through the medium of the dental service, twelve per cent of cases admitted to medical service, that had secondary infection due to tooth troubles. In my own analyses of over two thousand cases, we had ten per cent of individuals suffering secondary infections originating in the dental path.

I am bringing you these figures because they are true, and I do not wish to see you run to extremes.

Now, then, in the dental service in this hospital, the head of which staff has been our most valued friend and one of the foremost men in the state in a medical way,—Dr. Charles Lyman Greene, assisted by Dr. S. Marks White, George Head, and a number of other men equally well known,—we have, in analyzing the cases examined in the medical service, determined that twelve per cent of the cases admitted to the hospital showed dental path infections of a secondary nature, and I can show from the records of two thousand cases, ten per cent. So it does not behoove you to jump to the conclusion that every pulpless tooth must be extracted. You must not get lopsided. You would be just as must justified in saying that every appendix must be removed, or every pair of tonsils taken out, or every toe cut off that had a corn on it, as to jump at the conclusion that every tooth that becomes pulpless through accident or injury must be extracted. And I hope you will keep to the sane viewpoint on this subject. There are men who are so obsessed with the idea, that every time they look into a microscope, they see streptococci,—every time. I try not to see them except when they are really there, and I hope you will be equally sane in your judgment, in determining what you will do with pulpless teeth.

That is all I desire to say except to thank Dr. Johnson for his very able discussion of the paper.

Dr. Logan:

Now, there are two kinds of malpractice; one such as Dr. Johnson speaks of; and there is another kind of malpractice. The other kind is when it is not admitted that there is infection around a root end, when it is there, and to maintain that there is nothing the matter because the tooth is comfortable, and because the overlying tissue is normal in appearance. Now, don't miss that. It is malpractice to leave that tooth in the mouth, in that condition, as much as it is to extract a perfectly good, normal tooth,—and a little bit more so. It does not please you so much, but you have got to take that along with the rest.

Now, that is my message in regard to that. It is exactly what Dr. Johnson meant. This is the point,—to avoid the extraction of teeth that should be retained, and to remember that in the case of chronic infection, you may be saving a tooth which should be extracted. Then the answer is, to extract every tooth that has a chronic infection about it that cannot be permanently controlled.

DISCUSSION OF THE PAPER OF DR. T. B. HARTZELL, "WHAT SHALL WE DO WITH PULPLESS TEETH"?

Dr. E. S. Best, Minneapolis:

Mr. President and members of the Society and visitors: You must fully realize, after hearing these salvos of applause, and listening to this paper, the enormous amount of work which a man like Dr. Hartzell must go through, not only in the preparation of this particular paper, but, as I happen to know, at present in the preparation of several other papers; in fact, he has been preparing so many papers recently that it was not until within the last week that I was able to get a copy of this paper; and if I do not enter into details in discussing the different parts of the paper, it will be for two reasons,—that is, first, that I could not in any way emphasize anything he has said, and also, that I have not had time to go into the details of the paper, in order to familiarize myself with the very strong points which he has presented.

There is one thing which has been forced on my mind, gentlemen, during the last two years, and that is the rather peculiar attitude which a large number of members of our profession seem to adopt. I would liken it to a cartoon I saw recently, of Bismarck—or the ghost of Bismarck, as he stood contemplating some of the officers of the German army, some of the finest types of men that you can imagine. He says: "We have with us today the brains, the blood, the muscle, the flesh. But where is the diplomacy?" I rather think that sometimes our diplomacy is on a par with this, too. We will argue by the hour and refute all arguments advanced against us, and try to prove that we are filling the roots of teeth properly, and that we don't have any trouble, and that we can obtain germicidal preparations, and so on, and we know absolutely that our patients do not have any trouble with imperfect root canal operations.

Now, with your permission,—I was going to ask you if there was anything in particular that you would prefer that I discuss; but while I was listening to Dr. Hartzell's paper an idea occurred to me. And while I agree with him that in experience with systemic infection, you must not jeopardize the life of a patient by leaving in the jaws teeth which are even reasonably suspicious of being infected, but that in those serious cases the teeth must come out; yet, on the other hand, I believe that we ought to be conservative, and try to save as many of those teeth as we possibly can; because the best work we can place in the mouths of any of our patients, is not as good as the original work which Nature placed there.

As Dr. Hartzell says, "What are we to do with pulpless teeth?" I conceived, during the course of his paper, the idea of dwelling for a few minutes on "What shall we do with the pulps of teeth?" What did the surgeons do when they found their patients dying after surgical operations, and traced it back to infection? Did they throw up their hands and say, "No more surgery, they will die, anyway"? No. They got busy and established a technique for the maintenance of asepsis, and they decreased the death rate, and today they can perform surgical operations with a reasonable degree of assurance that their patients will not become infected. The thing that troubles us is that we have not been able to see the similarity between the opening into a vital pulp and the condition with which a surgeon deals when he creates a wound in his patient. We are dealing with exactly the same condition. The micro-organism does not require the open door to get in through, and although the wound at the end of the root is small, yet it is amply large to allow bacteria to penetrate into the peri-apical space. From the observations I have made during the last two years, I have become convinced of one fact more than another, and that is that if we do not have infection following the line of the operations that we have followed, and with such a lack of the maintenance of asepsis,—then the day of miracles has not passed. How could we prevent infection by deliberately introducing it into a wound? What else do you expect? You are bound to get it. If possible, we should put into practice a method that offers aseptic pulp canal surgery.

The failure in getting pulp canal filling material to the apical region, is not a crime, although a great many seem to think it is, and when they look at a radiograph, the one thing they seem to consider is whether that pulp canal filling goes to the end of the root, and yet you may not have any infection.- The end of the root may be closed off by cystoids, and any infection that may be inside of that root may not go into the peri-apical tissues. But do they consider the grave danger of performing an operation of this kind in the manner in which you all know we have been doing? In an examination of 288 cases of pulpless teeth, how many do you think we found with the pulp canal filling to the end? Fifteen. We had no means of ascertaining how many of those had been filled under aseptic conditions, or otherwise. The only information we could find was that only one of these fifteen teeth had a rarefied peri-apical area, and that did not convey anything, because that might have been there before the operation. Now, when you will take cotton from cotton holders on the brackets in front of you, subject to the atmospheric and other conditions in the office,—getting approximately 90% of cultures of pus-producing organisms; when you will get approximately the same percentage of pus-producing organism from a roll of sterile cotton in your fingers, and approximately the same percentage from chip blowers,—which I think are about the filthiest thing a dentist can use,—and the same percentage from using barbed broaches, will you tell me how we may expect to prevent these infections which we are fighting?

I will very briefly run through the technic which we have adopted in our efforts to maintain asepsis throughout an operation.

In the first place, I am firmly convinced that it is absolutely essential to use the rubber dam. I am just as thoroughly convinced that it is wrong to use the rubber dam without the holder sterilized. Now, we spray the mouth, paint the gums in the region of the tooth with iodin, put on the rubber dam and then with a sterile tool we open the pulp chamber. Where decay has encroached on the pulp of the tooth, the pulp or the tooth must be removed. Now, we have the pulp chamber opened, after having injected your aenesthetic; it is a comparatively simple process to remove the pulp tissues in large canals.

I think Dr. Gray recently made a very wise remark when he said: "Don't fight the canal. If you become impatient, it is infinitely better to seal the tooth up and let the patient go home and come back at some future time when you have a little more patience and determination to do an ideal operation." Well, you have gone as far as you could—and I have been surprised, sometimes, to see how often the bristle has gone to the end of the root without any reaming. If you find you cannot get to the end of the root, use sodium and potassium.

"How do you get rid of the result of the extra sodium-potassium?" Then introduce sulphuric acid which will neutralize the sodium-potassium. Then, use all the caution you can, or you carry back into the pulp chamber the results of the action of the sodium-potassium on the pulp tissue. It does not go through the end of the root. You will say that you have not quite reached the end of the root. How do you know? Before starting your operation, you have taken a radiograph of this case, and there is just as much technique required to take a radiograph as to make a crown, inlay, or anything else. You must adopt the technique and get a true image of that tooth and not a distorted image. You pass the bristle in as far as it will go, and take hold of it and then measure in the tooth how far you are from the end. Of course, this is approximately, but you will get a good idea of where you are operating. You now wish to progress a little further. Take the Kerr reamer and pass into the canal; give it a half turn to the right; don't turn the reamer around until you tighten it so tight you cannot get it out without breaking it; give it a half turn to the right, and take it out,—this prevents the instrument from breaking, and files down the wall of the canal. Now, substitute in the place of that reamer, a file,—much the same, only the spirals are closer together. You place the reamer in the canal, and by driving it backwards, you file down the walls of that canal; the secret of the operation being to get to the end of the root first and work from the apex back. Now we estimate that we are very close to the end of that root; then we seal it and have it radiographed. About the time you have the rubber dam adjusted, the radiograph is ready; then you can test your measurement and see just how far you have gone. We are now going to fill that root; get all the moisture out of the pulp canal, or you cannot fill it. You must remove the moisture with some absorbent material, and that absorbent material, of course, should be sterile. Dr. Hartzell has drawn your attention to the policy of taking it with your dirty hands,—bacteriologically speaking,—and rolling the cotton and plunging it into the canal. If you want to infect it, go ahead and do it, it is an ideal way; your bristles should have aluminum handles, and of metal that will not rust. You should have a hundred in lots of six; your assistant rolls these up in sterile gauze, and pins it up and places them in the sterilizer to sterilize. At the same time, in order to get away from dirty cotton holders, have the small cotton pellets which come in boxes, and they are placed in the squares of gauze and sterilized; the little points with which you absorb the moisture, must, of course, be made sanitary. The best way is to wrap in a package of gauze enough points, cotton and bristles for one operation, and don't open up the main stock for each individual operation. Then, remove the moisture; place a drier in there with just enough heat to dry it, and dry that out, and fill it with the Russell chloroform; and I think Dr. Hartzell has described the method of tamping the gutta percha down into the canal.

Now, when you have finished that,—I want to make this point strong,—when you have finished that operation you have probably had to explain to your patient, if he is a new one, your superior attainment and ability to do this work the way you describe it to him, and now you place your canal filling in there, dismiss the patient, collect your fee, and feel that that is finished.

Well, that enables you to have a radiograph, and when you see the finished radiograph and find that you did not get the filling to the end, as you thought you were going to do,—you are in a nice position. When you filled that canal, the patient said, "Are you through?" "Is it finished?" Now the thing is to reply at this time,—"I do not know; we will tell when we see the radiograph." And then this old bugbear of the measly dollar determining what professional men are going to do, will be a thing of the past. If the filling is not yet in, draw the gutta percha out and refill it, seal it with orychlorid of zinc cement,—and, so far as that part of the work is concerned, it is finished.

Dr. F. B. Kremer, Minneapolis:

I know why I got a round of applause. Somebody suspected that I was not going to say anything. For a very excellent reason, and one which I think will appeal to the audience, I was not apprised of the fact that I was supposed to discuss this paper by any individuals connected with the society or otherwise. The first intimation that came to me was a belated program which laid on my desk for several days before I happened to open to the page where this legend was written, and I did not receive the paper until yesterday afternoon. The first opportunity that I got to look at it was at 11 o'clock last night. And I have been engaged all day today in attendance upon these meetings. If you expect me to discuss a paper of that character with that sort of preparation, I must decline, out of respect to you and to the society, as well as for myself. The only thing that I could possibly say at this time is this,—and I regret this. I would like to have discussed this paper; it offers a great deal of material for discussion. The subject is so far-reaching and fraught with so much of moment to all of us that it is worthy of the closest possible scrutiny, and the deepest thought that we can give to it. I feel that it is of such vast importance that to talk unpreparedly upon it would be only to lose some of the value of it.

But there was one interesting thought occurred to me, as I sat here tonight,—What do the public and the profession owe to Minnesota? If you look back for a moment over the history of this particular subject, since I became acquainted with it,—I think about a year ago, Dr. Charles Mayo made a statement in Chicago speaking on this subject,—that the next great move or advance in preventive medicine must come from the dental profession. And he coupled it with the query: "Are we ready to accept the responsibility?" He is a Minnesota man, as you all know.

The next thing that occurred was at our annual meeting in Duluth last year, when Dr. Ulrich of this city read a paper in which he took up the question of the origin of the so-called blind dental abscess. Another Minnesota man. And to find the position which Dr. Ulrich took, so ably endorsed by so prominent a member of our own profession as it has been tonight, is a matter of a great deal of gratification to me, and ought to be to every dentist in the state.

I think that this is the greatest step that dentistry has ever taken; and to feel that it had its genesis here in Minnesota is something that we ought to be proud of. At that time Dr. Ulrich pointed out to us only this fact: That so-called "blind dental abscess" was of blood-borne origin. It seems to me that Dr. Ulrich, had he been prepared, might have gone a little farther and told us somewhat of the manner in which this occurs—the manner of ingress into the circulation, of this organism. He did not. But Dr. Hartzell tonight has given us the most ingenuous theory. I do not know whether he is correct, or not. He says he is uncertain, but that it appears to him to be a logical deduction from his study. I would not be surprised if he were right; and the lesson that he drew from it,—the necessity, in the event that it is true, in pointing out to us the gingival crevice as the point of entry of this organism into the circulation, indicating the necessity on our part for more thorough prophylaxsis, is one thought that I am perfectly willing and glad to take home with me, myself, and to urge upon the rest of you to think well on this, and to practice accordingly.

I wish I were prepared to discuss this paper. I am not. I feel that I cannot take up the subject matter of this paper. One thing I would like to say with reference to the title of the paper: "What shall we do with pulpless teeth?" Well, that is a question. But I think the only way to answer that, perhaps, is to say: It behooves us to familiarize ourselves with the possibilities of pulpless teeth restoration,—what they can do,—what they stand for. The man who would extract a pulpless tooth simply because it was a pulpless tooth, would be, in my judgment, guilty of gross malpractice. The true measure of the value of a pulpless tooth is to be found in its influence upon the general dental economy, and that is the only measure that you can use in determining what you will do with that particular tooth. There are thousands, yes, millions, I suppose, of pulpless teeth that, so far as we know at this present time, are not giving evidence of an influence of unkindly character upon the general economy. Whether this is due to the fact that we have not made proper search in those cases, or whether it is due to the fact that the patient's immunity is of such character as to neutralize the effect of such influence on his welfare, I am not prepared to say. I do not think we can measure the value of a pulpless tooth by radiographic means, nor by its manifestations locally in the mouth; but I think that if we carefully consider what they can do, and then make that the test, we will have but little difficulty in deciding just what we ought to do with pulpless teeth.

I thank you. I am sorry that I cannot say something of greater value to you, but that is about as far as I feel I can go tonight.

Dr. W. H. G. Logan, Chicago:

I came here with the definite understanding that I would do the best I could tomorrow. I think I will leave the subject alone at this time. Tomorrow, I am going, in a way, to take up the same subject, from another angle. I believe we shall have less infection to handle when we have the knowledge to properly diagnose the diseases of the pulp; and so, with that idea in mind, I shall discuss the subject tomorrow, as to what the clinical findings are when a pulp can be saved, what the clinical findings are when a pulp cannot be saved, and what the clinical findings are when a pulp may possibly be saved. Under those heads I shall discuss this subject, and then answer the question, "What shall we do with the tooth when the pulp must be removed?" I shall try to answer these questions tomorrow afternoon.

There is a thought in my mind which I will leave with you before taking my seat: It has been pointed out that upon the surface of the tooth there are certain bacteria that are pus-producing. It has been further expounded that these pass down the side of the teeth and lodge at the end, creating abscess. Now, since these organisms are present under the free margin of the gum over the tooth, in every mouth, around every tooth, at all times, from the time the tooth erupts until it is lost,—if these bacteria are potent factors in the abscess, it should be the rule to find the abscess more frequently around teeth with vital pulps, than without them. Because we have more teeth in the mouth with vital pulps, than without them.

I do not wish to enter into a discussion as to how this happens or why it does not happen, nor into the pathology of the subject, although I am greatly interested in it,—but in asking the question, I must say this,—that you men in Minnesota have many reasons to feel very proud, as has been indicated by your President in his paper, and by Dr. Hartzell, many and most valuable points have been brought out in the last few years here, that we should appreciate. Perhaps you would appreciate this more if some man from a distance had brought them to you. That is true of all of us. I believe you would appreciate more the work of Dr. Best, if he had been sent here from New York or Chicago. I wish to tell you of a tribute paid to Dr. Best. I do not know whether he knows it or not. In the recent work of Dr. Black, in one of the foot notes, you will find this statement: "The first outline of the proper technique to prevent infection in the treatment of root canals was given, so far as I know, last February (or April) by Dr. Best." Which was to say that in all the reading by Dr. Black he had never found the technique of filling root canals aseptically until it was recorded by one of your own men.

I could very properly go into the work, done by the older men in the great northwest. I know their work; most of it was started here by men not so active now, and many of you do not know the great work you are doing. But the great northwest has much to be proud of, the ideals and the demonstrations of the last quarter of a century. I am glad to have been here, and to have had this opportunity.

Dr. Hartzell (closing the discussion):

I am very grateful to you for listening to my paper. I think I have nothing particular to add. I have only given, in the radiographs I have presented, samples that can be multiplied many times over; for that reason I gave only a few.

As regards the question of abscesses and the filling of tooth canals that are primarily abscessed, I regard this question as unsettled, and I brought these arguments to you to show you that there is possibility of infection in other ways than through the root canal, itself, although I do believe that much of the infection does come by the way of the root canal. But when we can locate definitely, by teeth with unbroken enamel, any number presenting abscesses, and when we can find abscesses on the sides of the vital teeth, we certainly must concede that there must be some channel of infection save the root canal, and when we concede that—I think we all concede the necessity of aseptic root canal work.

I believe there is nothing so stimulating to me as to see constructive work on the part of my fellows. I believe there is nothing that has given me greater happiness, than in doing something that is constructive. We all make mistakes, but when we make a success, and a success that will help others, I think there is nothing more stimulating than to bring it to the attention of those who would desire to profit by it.

I am very sorry that I did not get a copy of my paper into the hands of these gentlemen earlier; but, as was said by Dr. Best, I have been getting ready four papers, at the same time.

I think, if you will take home the various facts that I have tried to present, and those that have been presented by the men who have so ably and keenly discussed my papers, that it may be of some help to you in shaping your course for the study of this vital question.

I thank you all.

ODONTOLOGICAL SOCIETY OF CHICAGO

The regular monthly meeting of the Odontological Society of Chicago was held at the Chicago Athletic Club, at 8:00 P. M., October 4, 1915.

President Dr. A. E. Royce, presiding.

Dr. Emil G. Beck, at the invitation of the Society, spoke on the subject of "The Treatment of Sinuses of the Head by Means of Bismuth Paste."

DISCUSSION.

DR. TRUMAN W. BROPHY:

I feel that we have made no mistake in extending this invitation to Dr. Beck because we have enjoyed so much what he has told us.

The definition he has given us of a sinus, its developments, its relation to the tissues and the methods that he has employed in treating it, are all of great value. When bismuth paste was first introduced to the dental profession through the instrumentality of our lamented professional brother, and his brother in blood, Rudolph, many looked upon it as something of an experiment. But Rudolph in all his enthusiasm based his statements not only upon his own clinical experience but that of his brother who developed it. It is known throughout the world as Beck's paste; Rudolph knew that it was not experimental, that it had real clinical value. It has been demonstrated beyond all question of doubt that bismuth paste is a potent agent in the healing of sinuses and abscess cavities under certain conditions. I have seen cases in Dr. Beck's hospital in which the paste was used in contact with carious bone. If I had been asked, before seeing these cases heal, what influence I thought such treatment would have upon the sinus, I would have said that the diseased bone must first be removed. I still think it is best to do so, but under certain conditions it is not easy, and under just such conditions the carious bone has been exploited and the surface has healed under the influence of the paste. It is certainly of inestimable value in the treatment of certain cases. Dr. Joseph Beck has treated with it, successfully, sinuses of the ethmoid cells, in which there was carious bone. The brothers Beck have had an idea which they believed was right and have stuck to it until they have worked out that which others had not known. As far as its use in the treatment of the great maxillary sinus is concerned, I have used it, and sometimes found that it does not work as well in this great sinus as in the small sinuses. In some cases it is necessary to resort to other means. In cysts, such as demonstrated to us tonight, it has proved of value, in fact, all-efficient. But like everything else, it has been abused. It has been used where it ought not to have been used, and where its use would be contraindicated. Too much has been expected from it, and naturally such expectations have not been realized.

As a member of the Odontological Society I feel we have been very fortunate in having Dr. Beck with us this evening, and I hope and feel justified in saying that we will be very glad to have him come to us at least once each year, not only that we may receive the benefit of his scientific investigations along lines which are of interest to dentists, but so we may have also the warmth of his good fellowship.

DR. J. H. WOOLEY:

I would like to ask the doctor, in the administration of this bismuth if injected through a sinus, presupposing the sinus to be open, if healthier granulations will occur, or to a more rapid extent? With regard to the bismuth, going back to the experience of Dr. Atkinson, in the building up of the gum tissue, he used a sponge, and claimed that the tissue permeated the pores of the sponge, and finally the sponge disappeared, and the gum formed around the neck of the tooth. In the redevelopment of these tissues, do they permeate the bismuth so that solid tissue is formed in the area that was caused by the destroyed condition?

DR. BECK:

No, the bismuth is not permeated by the tissues. It is mixed with the vaseline and the vaseline prevents it from adhering to the cellular structure. The injected bismuth will act more as drainage. It is oily and the secretions will exude along its side and the bismuth will escape as the sinuses contract. The action of the bismuth is that in coming in contact with infected tissues, it will hydrolyze the nitrite from the bismuth subnitrite, and the nitrite will act as an irritant to the infected area. A very decided leucocytosis will take place and destroy the microorganisms in the wall of the abscess cavity and sterilize it.

In infected sinuses other than the mouth, the pus discharge will become serous after a few days and will contain no microorganisms. After the sinus is once sterilized the natural tendency is toward the contracture of all the tissues; the granulations will become more fibrous, closure will take place and the natural conditions will be restored.

But there is no growth into the bismuth itself. The bismuth will become encysted and will not do any harm, even if it remains four or five years. It may be absorbed by the leucocytes, as I have shown by experiment. It will not form a framework for the granulations to go through.

DR. WOOLLEY:

Is this bismuth made antiseptic?

DR. BECK:

It is sterilized by boiling. The leucocytosis is the sterilizing agent.

DR. RISDON:

I would like to ask Dr. Beck the percentage of bismuth which he would recommend for injecting roots, also the percentage used in the injection of larger cavities. It struck me, would it not be a good routine treatment when after an abscessed tooth has been treated for several days, and when one has reached the conclusion that the tooth is ready to fill, would it not be good technic to inject that root with a certain percentage of the bismuth paste? Leucocytosis will thus be increased and drainage will be established. Would it not be good technic to inject it and remove what you can and fill the root as well as possible?

DR. BECK:

I have had too little experience in dentistry to advise you. I think there are conditions in the teeth which may prevent our obtaining results such as we are able to obtain in other parts of the body. I do not know whether it would be possible to force the paste into all the crevices of an enclosed root. I have had no experience with it, and cannot speak with authority on it. The principle of applying this method is, if you wish to obtain results you must fill the entire suppurating area, and where there are small cavities, as in the mastoid, a cure is impossible, because only part of the tract can be disinfected, and reinfection from the original focus will occur. Here it is necessary to break down all the small lamellae, so as to make one big cavity out of it, and then inject it with bismuth.

You gentlemen of the dental profession have the opporits use will be of much benefit to us from that standpoint. I have in mind some few cases where I shall employ it that I may get radiographs which will more clearly show the extent of destruction caused by alveolar abscesses and their sinuses.

Another thing I was pleased to hear Dr. Beck say and that is that the paste may be used with impunity around the jaws, i. e., that the amount it is possible to use around the head could not possibly produce any toxic effect. When bismuth paste was introduced I used it considerably; then I heard of its toxic effect and that caused me to use it less and the last year or two I used it very little, but having heard Dr. Beck assure us that we need fear no harm from any amount we could possibly use in our work, I will certainly use it for its therapeutic effect also, for I know it is a valuable agent.

.Dr. J. G. Reid:

I should think this would be particularly useful especially in third molars after the tooth has been removed; especially in cases of impacted third molar, in the pockets left by the absence of the tooth much benefit may be derived by the use of the paste, and keeping them healthy where they usually become infected and often cause much trouble. I know of several such instances where the tooth has healed well without infection, by closing up the pocket immediately after the operation. The best results in my own experience have been in such cases.

Dr. C. Gurnee Fellows:

I do not criticize the dentists for capping teeth and trying to save them, but they do not always look beyond the cap or crown of the teeth. I have had three cases recently in which the eyes have become infected from bad teeth, where the bad condition was not supposed to exist in the tooth, and quite a notable case within a few days. This patient has been having a phlyctenular-kerato-conjunctivitis for two or three years. She has had a recurrence of trouble which developed in the episclera and in the sclera, which interfered with her appearance and caused pain, which was relieved only by aspirin. She cleared up under the iodids. She had her teeth put in good order. After three months she had another attack. I discovered a crowned tooth on the upper jaw on the same side as her bad eye. Upon X-ray examination nothing showed. Her trouble tunity and the material to work this method out in dentistry. As it is being applied by surgeons more and more, there is no reason why dentists should not employ it also. The larger the experience with it the better are the results. The dentist has it in his power to prevent many general bodily ailments. The teeth are a great source of general infection, and it is a great advance in dentistry to cure these sinuses without extracting the teeth.

Dr. Brophy:

I wish to relate a most extreme case, that of a patient who had a persistent sinus following the loss of the right lower first molar tooth. Upon failure to heal the sinus the bismuth paste was used. The paste disappeared. More was put in, and it also disappeared. On taking a radiograph it was found that the sinus extended from the molar tooth downward into the sternum. A carious cavity in the sternum, three inches in diameter, was distinctly outlined by the paste. The discharge occurred through a sinus at this point. The surgeons had operated on the patient and had opened and curetted the sternum, but pus all the time was passing from this tooth socket down into the sternum and out of the sinus.

Dr. G. Walter Dittmar:

Mr. President, I want to express my thanks to Dr. Roach for inviting me to this meeting. I have certainly enjoyed the evening and feel that I have learned several things from Dr. Beck's excellent lecture.

Dr. Brophy has discussed the subject so well and covered the ground so thoroughly that I can add nothing of interest. I will say, however, that when bismuth paste first came to our notice some years ago, through the work of our lamented friend, Dr. Rudolph Beck, I employed its use in a number of cases and most always with gratifying results. I used it in chronic abscesses, sinuses and bad pyorrhea pockets, often as a last resort in rather hopeless cases, and while it is not a cure-all, it certainly did much good in those cases where there had been much destruction of tissue.

Dr. Beck with this excellent exhibit of radiographs and stereoscopic pictures certainly demonstrates the value of bismuth paste when used for diagnostic purposes. I can see how still continued, with no effect from the aspirin, iodids or the salicylates. Finally, she had the cap removed, and an abscess was discovered about that tooth, and upon proper measures being taken the eye cleared up within ten hours. I have had three of those cases within a week, thus showing the connection between the teeth and the eyes.

Dr. Davis:

What kind of a radiogram do you have, a plate or a film?

Dr. Fellows:

A film?

Dr. Davis:

I had an opportunity within the last few weeks to see a marked case of trouble with the eye which might possibly be due to the teeth, and I sent the patient to have a radiogram taken, and I could not get any expert X-ray man to take any except on plate. A six or eight-inch plate to take the radiogram of a tooth root is not very clear to the average dentist. A small film within the mouth, and a direct picture of the root through the one process plate, right on to the film, is much better than an X-ray picture of the entire head on a glass plate.

Dr. Fellows:

I have many of the pictures taken on films.

Dr. Davis:

I found that in that city where this patient lives that it was impossible to get any radiographs taken except on a six or eight-inch plate.

Dr. Fellows:

In this case I referred to, the question is whether to take the root out for fear it will damage the eye. I advised the removal of the root.

Dr. C. N. Johnson:

We are complimented in having two distinguished members of the medical profession with us. These meetings are beneficial which bring the medical and dental professions together. Dr. Beck's paper brings vividly to us the memory of his brother Rudolph, who was a shining light in the dental profession during his life. It is a pleasant experience for us to have a paper from Dr. Rudolph Beck's brother.

The essayist has referred to the fact that there is no danger from bismuth poisoning in its use in the jaws or about the mouth. On account of my impressions as to the danger of bismuth I used it with much caution. I tried it in only one case of antrum trouble; and the doctor in referring to Rudolph's notes called to mind a report which I made on it at that time. I have it here and will read it. Dr. Beck made the statement that it had been less satisfactory in antrum cases than in other sinuses. This case I refer to was one of empyema of the antrum of long standing. The report says: "Curetted antrum and filled with the paste. It caused such discomfort and the case seemed to be so foul that the paste was removed, and argyrol was used. After that the case was recovered." That case discouraged me more than any other. There it seemed to be a total failure. Immediately after the removal of the paste and treating it with argyrol it cleared up very quickly. I have other cases to which I referred in this report, chronic alveolar abscesses, in which the results were gratifying.

Dr. Beck's statement tonight in regard to the technic will enable me to use the paste more intelligently hereafter. I have not used it recently as much as I did when Rudolph introduced it to the dental profession. Everything that we can get that will broaden our vision and give us a larger armamentarium for the treatment of these sinuses will be so much added benefit to the profession.

A great deal of damage is being done through the false interpretation of the X-rays. Many teeth have been condemned to the forceps on the evidence of the X-ray when the teeth were absolutely innocent. We must learn better how to interpret the X-ray, or we will leave teeth in the mouth that should be extracted, and we will continue to extract teeth that should be left in the mouth.

DR. J. E. HINKINS:

I would like to ask Dr. Beck if this paste disintegrates with age? Does it lose any of its power with age?

DR. BECK:

It does, it should be made fresh, as soon as the vaseline separates from the bismuth. The bismuth when the preparation is fresh is in the form of a uniform emulsion. When the preparation is boiled four or five times the vaseline and bismuth separate and the paste should not be used.

Dr. J. E. Hinkins:

I observed that when I used it stale I had more failures than with it fresh. After the little scare we had some time ago about the toxic effect, I have not used it very much. I have, however, used it in four or five cases. I can use it more intelligently now than I could before.

Dr. Davis:

What Dr. Beck has said emphasizes more strongly the fact that we should use something in order to secure a correct interpretation of the radiograms, and the use of the paste will help that very much. That is the strongest part of the argument which has been put forth this evening. What Dr. Johnson has said is absolutely true, and I think too much weight is given by the dentist to what the radiographer has to say about the case. The dentist should learn to interpret what the picture shows, and not to depend for his diagnosis on some one who does not practice dentistry.

Dr. F. E. Roach:

I do not think I have anything of much value to add. While my experience both in front of and behind the gun, with regard to bismuth paste has been considerable, it has been more particularly in front of the gun. The point which I would have made has been well emphasized by some of the previous speakers, and that is in reference to the great use to us in diagnosis of the bismuth paste. In many instances our skiagraphic pictures are so indistinct and indefinite that it is difficult to make a definite diagnosis as to the origin of the sinus infection. There is no question in my mind but that if we use the bismuth paste in these cases our diagnosis will be much more positive.

I do not believe it is expected we will get any particular curative benefit from the use of this remedy. I have been made to respect and have a great deal of admiration for this paste since having been treated myself. I know that I have used it timidly. I have not put force enough behind the gun to drive the paste into all the remote crevices of the sinuses or pockets. When Dr. Joseph Beck injected my sinuses, he used a very large gun and several assistants. It seemed as if the pressure exerted would tear down the walls of my head. I could hear it penetrating and crackling and going into the sinus, but I am satisfied that is the way it should be used, and that is the way we will get the benefit from it, particularly in ferreting out these difficult and uncertain sinuses, so that the picture of them may be brought clearly and distinctly before us, and we can see their origin and their source.

It has been a great satisfaction to me to have Dr. Beck come to us with this splendid remedy, and to assure us that there is no danger in our use of it. I have an outfit and I did use it somewhat, but like Dr. Johnson I became a little afraid of it, after having heard of the danger of bismuth poisoning and abandoned it. I am very much pleased to have Dr. Beck's assurance and to have him point out the splendid technic which he has, and to have him bring to our knowledge its value in diagnosis and in therapeutic results. We can usually get rid of our alveolar abscesses and sinuses if we can locate their source, comparatively easy. The use of the paste will aid us in the location of these sources of trouble. Like many good things that are brought out we try them and if we make a failure of them the first time we throw them aside and become indifferent, and often we fail to get the benefit of very valuable aid which we might have. I am going to try this out again, and I believe I can get some real benefit from its use.

Question:

When Dr. Beck was injecting the bismuth paste, Dr. Roach, did it cause any pain, the enormous pressure?

Dr. Roach:

None whatever.

Dr. Brophy:

I would like the opportunity to say a few more words. I feel I ought to make this statement regarding the taking of Roentgen photographs, because it is a fact that we have very poor Roentgen photographs coming from the hands of men of repute. The last patient I saw today had some Roentgen photographs that had been focussed on a field that did not interest me. I was not looking for any abnormality in that field, but farther back, involving the tuberosity of the maxilla on the right side; and this skiagrapher, of eminent repute, had focussed his picture on the cuspid and bicuspid teeth which were beautifully portrayed, but where I wanted it it was so dull that I could not see anything. I had to send the patient back to have another skiagram made. I have had five or six different skiagraphs made of the same patient, and in the last one I could find the abnormality that was not visible in any of the others. That being the case, it is not only the ability of the man to read the Roentgen photographs, but it is important that he should also have informed the skiagrapher as to what he is looking for. Tell him to make one which will reveal this part clearly. Dr. Beck knows that sometimes one will not show anything abnormal, and only after several times something is found which reveals the nature of the disease. The presence of an abscess is no indication that the tooth should be taken out, any more than a case of osteomyelitis is an indication that a leg should be amputated. The principle is precisely the same in each case. Osteomyelitis is an infection in the bone that is most frequently amenable to successful treatment, a dental abscess is an infection about a tooth which may be cured and the tooth preserved to perform its functions normally. Too frequently I have learned that the presence of an abscess is thought to be sufficient cause for the loss of one or several teeth. These abscesses may be often treated and cured and the teeth preserved. Yet in some cases the loss of bone, the destruction of the tooth and the absorption of the roots is such that extraction is most judicious. What we do, depends upon what is the matter, and knowing what is the matter and the character of the disease before us, it is our duty to decide what course to pursue and how to manage the disease so as to bring the parts back to normality.

President Royce:

I do not feel competent to discuss this subject very intelligently. The first delightful thing at this meeting is our guest, and second is our guest and his paper. We need inspiration from those outside of our own members, and from other professions, and Dr. Beck has given us a treat; and the discussion of others outside of our own members has been very gratifying. I wish in the name of the society to thank you for your presence and for your discussion.

Dr. Emil Beck (closing the discussion):

I believe I can make one suggestion which will be of help as to radiograms. I take very few radiographs by means of the film, because I am not often called upon to treat teeth, but I know of one method which will give you great help, and that is the stereoscope. Even if you take a whole head stereoscopically, the shadows which in a single picture are blurred, will become more concrete through the stereoscope, so that the structures will become very plain. In the stereoscope the outlines can be seen very distinctly and the finer points will be brought out. It is better to have a full-sized picture, if a good one can be obtained. If a single tooth is to be observed, I think the film is an excellent method.

Have the radiographers not thought of making stereoscopic pictures by the film method? If you put between the two films in the mouth a piece of lead by which you can have two pictures of the same area, by shifting your anode two and a half inches, the pupillary distance, you will probably get stereoscopic pictures of a single tooth in that way. It could probably be done by placing the film underneath the jaw, but the stereoscopic picture I employ in all parts of the body. I have been working on this for years and I have induced many surgeons to use this method, so that it is now quite extensively employed. I know of one article in the dental literature several years ago in which most beautiful stereoscopic Roentgenograms of the jaws were exhibited.

The interpretation of the pictures is the most important. The taking of the picture is comparatively easy, but it is much more difficult to interpret it correctly. It is the duty of the dentist to interpret his own picture after he has informed the radiographer just what he is looking for. Without the clinical history, the radiographer is unable to make the diagnosis, and whoever tries to make a diagnosis from a picture alone, without the history, is likely to blunder.

I have probably learned from you more than you have learned from me.

CHICAGO DENTAL SOCIETY.

A regular meeting was held November 15, 1915, at 8 p. m.

The President, Dr. F. B. Moorehead, in the chair.

Dr. Karl G. Knoche read a paper on "Removable Bridgework," which was preceded by a demonstration of this work in the mouths of patients and a clinical exhibition.

Discussion.

Dr. F. H. Orton, St. Paul, Minn.:

Mr. President and Members of the Chicago Dental Society:

I am deeply sensible of the honor of appearing before this distinguished body of experts and critics. When the invitation came to discuss Dr. Knoche's paper, I was torn by conflicting emotions: appreciation of the opportunity given me to add my word to what Dr. Knoche has said on his subject; and panic at the thought of appearing before so critical a society. As is the case with Dr. Knoche, this is my first appearance before you, and judging from my eminent colleague's remarks, my feelings are not unlike his own.

Dr. Knoche has passed over the ground with so wide- Because of his extensive experience in handling large rstoration cases, he has acquired an ability which entitles him to be named a specialist in his field. The average dentist, no matter how great may be his native talent and his technical knowledge, cannot hope to acquire from the occasional opportunity which may present itself to him in his general practice, the ingenuity and special skill of one to whom these difficult cases are of daily occurrence,—the staple, in fact, of his work. Constant practice here cannot but result in an unusual dexterity, not only of the hand, but in a commendable facility in devising expedients to overcome difficulties, in inventing appliances; in a word, of adapting to a peculiar degree of excellence, means to ends. In such expert work—and I here use the word expert in its truest sense—a factor as important, if indeed not more important than the mechanical skill required, is the creative faculty.

Dr. Knoche's paper may be regarded as expert testimony. sweeping a reaper that there is nothing left for his successor except a few gleanings. Even a slight clinical experience in this field would enable one to recognize that he has emphasized the fundamental essentials. All that I can hope to do, therefore, is to add a few facts that may bring us a little nearer to the truth; for what we most sorely need is a clearer perception of the truth.

Now that my remarks so far have brought me to this statement—that one of our greatest needs is a clearer perception of the truth—I should like to dwell upon it for a moment because it has so many facts, because it throws light in so many directions. The dental profession, judging from our periodical literature, is on the defensive. Where shall we place the responsibility for this humiliating position? Let us be straightforward; let us begin by examining ourselves. Do we as a profession exalt and reverence the truth? Permit me to answer this question by asking another: Do dentists, general speaking, distinguish strictly between pseudo-science and science? You may reply that our theories are founded on facts. That may be true, but it is also true that facts and the truth are not necessarily one and the same; facts are *parts* of the truth. The truth, as I conceive it, is *all* of the facts in their right relation; that is, the relation which they must bear to each other when the final and whole truth is attained. If we bear this bit of philosophy in mind; in other words, if we have an abstract idea of what the truth is, we shall be less likely to err in the belief that we are right before we know the whole truth.

To come back now to the subject in hand. Dr. Knoche has had special opportunities to become acquainted with the crown and bridge work in vogue. His estimate of this work might seem to us to be very harsh had not the many forcible expressions of disapproval which have appeared from time to time in our journals since Doctors Hunter and Chayes set the fashion, calloused us to rebuke. We are all of us more or less convinced, I am sure, of the necessity for improvement. We do not need to wait before we are forced to it by the lay public. I thoroughly believe that the average dentist is both willing and anxious to do whatever is necessary to be successful in the best sense of that word. He wants not only to be fair to himself, but also to his patient. The great trouble is that he finds himself in the situation of not being able to acquire the knowledge needed to do the right kind of work. This is true partly because the censures, with very few exceptions, passed upon crown and bridge work have been of the nature of destructive criticism only. In other words, too much emphasis has been put upon analysis or dissection of the problem, and not enough proportionately upon the reconstruction. Let it be understood that I do not condemn destructive criticism. I understand that it must always come first, that it clears the ground, as George Bernard Shaw has so ably said, for construction. And the time has now come, in my opinion, for constructive criticism.

Dr. Knoche has urged the need of a standard of criticism. I most heartily approve of this suggestion. A scientific standard which will be consistent with the prophylactic requirements which have become so popular (in theory) would enable us to classify into groups the various types having similar indications. This would also have the effect of discouraging the claim for universality,—an obsession which seems to dominate the mind of every dentist who has some slight modification to suggest. I have been so often irritated by the evidence of lack of a proper standard that I have almost come to believe that there is no more unreliable testimony than that of the expert who has an axe to grind, who has his own little way of doing things, and who, grasping a single fact from a whole body of truth, proceeds to preach that and that only as the complete truth. We may and ought to acknowledge their fact as facts in our classification, but this is all that should be asked of us.

The adoption of such standards, however, implies the recognition and understanding of natural laws or principles. It is interesting to note in passing that every art which has evolved from the empirical to the scientific has found it necessary for its highest development to formulate standards. This is true of those branches of our own art which may now be said to be upon a scientific foundation. Excellent examples of this fact may be found in both operative and orthodontic dentistry. But I believe that there are men in this society who can well remember the long and painful experimenting in these fields; the repeated and blundering efforts to fulfill needs, the new methods suggested and tried, often ending in pain, disappointment and loss before definite results were obtained. The period of rude experimenting was no doubt necessary. The best ways of doing things had to be discovered by trying first one expedient, then another, until methods involving less pain, disappointment and loss were evolved. Each experimenter had to come to profit by his co-experimenter's errors and gains until gradually there emerged from the myriad of experiments a concurrence towards that which was the most expedient and the most successful. In mathematical phraseology, at last the constant was found. It is not necessary, perhaps, to call your attention to the fact that deductive reasoning was not a conspicuous factor during this period of development. For proof of this statement I have only to refer you to Harris's *Principles and Practice of Dentistry,* or to any of the earlier works on Orthodontia in which the absence or the recognition of any principles was made up by a description of a confusing array of appliances. It was not until we recognized the significance of the areas of comparative susceptibility and immunity that the shape of the tooth was acknowledged as a possible predisposing factor in the production of caries and gingivitis. An equally important factor was discovered to be the relative position of the tooth with respect to its neighbor, its occlusion, et cetera. Thus, out of the mass of experimentation, modern dentistry has come to emphasize a fundamental principle; namely, the requirement that each operation ought to be so devised and carried out as to prevent a recurrence of decay or of injury to the soft tissue.

Dr. Knoche has admitted these considerations, I believe, when he emphasized the importance of the study of dental anatomy. The study of dental anatomy has, as a matter of fact, up to the present time, contributed largely to a solution of our problems. It has been recognized, for example, that an intimate knowledge of the forms of the various surfaces and the surface markings is indispensable to a full comprehension of the theory of extension for prevention. Orthodontia, viewed from the angle of a prophylactic measure, acknowledges these same principles. A little reflection will suffice to show what clinical experience abundantly demonstrates,—that these same principles have an even more important application to crown and bridge work. I include, of course, abutments in removable bridge work.

At first thought in discussing this paper, I was tempted to devote some time to the important subject of root preparation. From Dr. Knoche's curt dismissal of the subject, one might be justified in inferring that it was of secondary significance. Yet it must be clear to any one with the slightest knowledge of dental anatomy that neither mere ingenuity, nor even the greatest amount of mechanical skill can in the least compensate for an improper root preparation. But with this word, I will pass on to other considerations.

Not only is it necessary to have an intimate knowledge of the anatomy of the tooth and of the soft tissues covering that portion of the tooth from the gum line to the gingival line, but it is also important to have a very vivid visual image of this cervical portion during the instrumentation for the removal of the enamel. We are further confronted with the necessity of thoroughly understanding the relation of the dentin and enamel to the contour of the tooth. Especially is it important to know the form of the enamel as it approaches the cementum. In spite of these facts, that part of dental anatomy which has a special bearing upon crown and bridge work, has been strangely neglected. It is my belief that a proper root preparation for a banded crown, when the tooth is in a normal position in the arch and the band is to extend root-wise as far as the gingival line, requires the complete removal of the enamel. -

An important point to bear in mind during the scaling of the enamel is the extent to which the gum cuff or free gum margin extends from the gingival line over the enamel of the crown. I am of the opinion that we have a free gum margin which varies from one and a half m.m. to three m.m. extent in an adult. Under normal conditions the margin in the case of younger patients is somewhat greater. Now, the removal of the enamel from the dentin for a space upwards of three m.m., underneath the gum tissue without at the same time doing an injury to the gum tissue and to the peridental attachment, requires so high a degree of surgical skill, and is so laborious an operation, burdensome alike to the patient and operator, that we should like to be quite sure of its necessity before insisting upon it as the normal and usual procedure.

A description of the relative proportions of the tooth occupied by each tissue will, I think, serve to clear up this point.

The contour of the tooth is made up almost entirely by the enamel. Beginning at the gingival line by a beveled or champered edge, it gradually increases in thickness until the points of the cusps are reached. Here we shall find the thickest enamel. The enamel also will be found thick underneath any ridges or elevations on the various surfaces. This thickness of enamel is formed by the increased convexity of the outer surface. The dento-enamel junction (or axial wall of dentin) passes toward the occlusal surface with little or no convexity,—only a slight inclination toward the axial line of the tooth. Now, if the anatomical description just given is accurate, the necessity for the entire removal of the enamel is obvious, if we are to have our crown or abutment in close contiguity with the entire gingival circumference. I realize, of course, that the description which I have just given of the relation of the enamel and dentin to the contour of the tooth is very sketchy. If time permitted I should be very glad to go into detail, especially since this explanation of anatomy cannot be found in any published work, and since its importance cannot be over-rated. Other things being equal, it is certain that he who depends upon a sense of touch alone in this delicate work, will do more damage to the surrounding tissue than he who is aided in addition by a clear and sufficient knowledge of the character and the shape of the structure upon which he is working. My hope is that even in this brief calling of your attention to the relation of the enamel and dentin to the contour of the tooth, the necessity for the removal of the enamel from the tooth in its entirety has been so conclusively demonstrated as to be recognized as a fundamental principle. If we adopt this as a standard from which a proper root preparation may be judged, and if we further adopt as our standard of criticism for the finished crown the exact reproduction of the surface anatomy of the natural tooth, especially of those forms which are recognized as having a particular bearing upon the production of favorable conditions, then we shall at least have placed and enunciated the principles which should govern the practice of all types of crown and bridge work in a position which will not be inconsistent with the fundamentals of prophylaxis.

Dr. Knoche has very modestly refrained from making any superlative claims for the superiority of his particular type of removal bridge-work. This is, to say the least, unusual, and is at the same time a tacit recognition of the fact that any individual's method is chiefly valuable to the individual who invented it. That he is the successful author of an unusual number of large restorations is generally acknowledged. The fact remains that the high degree of skill demanded, the attention to minutiae and detail emphasized as necessary requirements in this work, restricts it to those men possessing such skill or even genius. What we need, let me again insist, is the development of some technique in which the essential details have been so sufficiently amplified as to enable the man of only average talent and knowledge to undertake this work without endangering the health of his patients.

Dr. Hart J. Goslee:

Mr. President, Ladies and Gentlemen: I was extremely interested in the discussion of the subject of the evening which has just been presented by Dr. Orton, and I want to pay tribute particularly to the latter part of the discussion in which he made especial reference to the position and attitude of the medical profession with regard to dental disturbances at the present time. I am heartily in accord with the sentiments expressed by Dr. Orton in that connection. I was also interested in hearing him say something in regard to the feasibility of inserting bridges and of applying artificial crowns over and upon teeth containing vital pulps. Were it a more fitting occasion I should be happy to enter into a discussion with him along that particular line, but I understand that he is going to read a paper in New York this winter on that subject, and I am invited down there at that time, so I will have opportunity to thresh that out with him then, and hence will not enter into it at the present time.

Mr. President, I am not going to enter into any lengthy discussion of the paper and the previous discussion, both because of the lateness of the hour and because I do not find much that I would feel warranted in discussing, because I do not differ with the essayist to any very great extent. He starts out with the statement that many of the members of the profession at the time of the appearance of the article of Professor Hunter of

England disagreed with it. We resented his statement. I think a very large part of the profession when they first read that article felt intuitively, so to speak, that it was up to them, necessarily to resent it. But a careful analysis of that article, followed by somewhat close study, I believe has subsequently convinced almost every thinking member of the profession that Professor Hunter was correct in almost every statement that he made. He was not condemning good work, but he was condemning that large proportion of work which all of us see and which we cannot say is good.

Dr. Knoche leads up to the requirements of bridge-work by making that statement in a very splendid manner, and what he means to interpretate to you and to me I am sure is that whatever class of work we use, whether it be of a fixed type or of a removable type, the special thing that we must look for and obtain if that work is to be successful, is adaptation. If we obtain adaptation by whatever method we may choose to employ, with whatever technic or system we adopt, if we obtain that adaptation, we are going to diminish, if not eliminate irritation. And it is the irritation coming from faulty adaptation that gave Professor Hunter the right to write and read the article that he gave to the profession some time ago. And it is that same faulty adaptation that gives to Dr. Knoche tonight and to everyone the right to criticise the work which he sees in the mouths of patients.

I am not willing to go quite as far as he does in his general condemnation of all kinds of crowns and bridge-work. I do not think that we have not progressed any at all in this line of work as he would seem to indicate in his paper. I am of the opinion that we have progressed rapidly, and yet I grant you that we are far from perfect even yet. But if we will continue to progress as rapidly in the immediate future as we have in the past I am confident that such criticisms as can now be justly made so often, cannot be made at all. The success which we may achieve depends entirely upon the degree of attention we give to the minutiae and detail, and I am sorry to acknowledge that it is my belief, based upon observation that only a few members of the profession recognize that as being so essential. They are willing to neglect minutiae and detail. They want to do their work too quickly; and as a result of neglecting observed minutiae and detail the final result achieved must suffer, and hence criticisms can be rightly given such as have been offered here tonight.

It is up to us, ladies and gentlemen, and I believe it is possible for everyone in this room to successfully fit a root. It does not in my judgment require any unusual amount of mechanical ingenuity to do that. It is simply a question whether or not we will be patient enough to observe this minutiae and this detail which is necessary to make it possible for us to fit a root, and if we can fit a root by any of the means that have been suggested here tonight or by any other so as to avoid irritation, and I believe that is possible, then we are going to eliminate a very large proportion of the failures which have been referred to.

That thought leads me to another statement made by the essayist, in which he more or less generally condemns the use of bands on artificial crowns. This is an old subject. It has been discussed ever since I have been a dentist, and it is still being discussed and it is worthy of discussion. Dr. Knoche uses more or less a trite illustration, but he says to you that it is practically impossible from a mechanical viewpoint to fit a cylinder over a conical-shaped root and have the edge preserve the continuity of the root when in position. That is absolutely true. You could not contradict that if you wanted to. But Dr. Orton has gone a step further and called your attention to the root preparation, and that is where the faulty adaptation and failure comes from, not so much because of the impossibility, but because of the fact that there has been a neglect to observe the principle involved in the preparation of the root before you make any effort to fit the band. I am not fitting bands to conical-shaped roots. I am trying to prepare those roots so that my bands will fit them, and I believe most of them—some of them I think, at least, do fit, and some of yours will fit if you will pay that same attention to root preparation that you would to any other part of your work. Because of the difficulty encountered in this procedure incident to the preparation of the root—it is done in a more or less perfunctory manner, with the result that the bands do not fit. There are certain types or classes of cases which I work upon, in which I would not think of building an artificial crown without some form or type or kind of band, because I want to permanently protect that root against the possibility of fracture against the additional stress to which it is to be subjected in carrying any form of removable or fixed bridge-work, and I feel that a short well fitting band is the best means at my command which will insure that possibility. I have in mind, and I think I have taken occasion to cite this particular case before, where an upper cuspid root on the right side of the jaw in the mouth of a woman forty years of age had carried the anterior end of a three-tooth bridge for a number of years, two or three years; that bridge being built in porcelain, with platinum copings, and no bands. From the stress of mastication—it was not an overly extensive bridge,—that cuspid root came back at the end of the two or three or four years, however long it was, fractured completely and useless, meaning the loss of the tooth, and it was a very serious calamity to that woman, because what was adjacent to it would never take the place of that cupsid. The presence of a well adapted band, no matter how narrow to a properly prepared root, would have absolutely precluded that possibility, and I am confident if that had been done that cuspid root would have been in there yet. At the present time the centrals and laterals together are trying as best they can to answer the purpose of the cuspid root, which was lost only through the absence of a band, in my opinion.

Now as to the expansion of the wax investment material. I do not agree with Dr. Knoche at all in the fact that I want my wax expanded, and my investment mould expanded in order to make a casting that will fit a porcelain facing, to overcome the contraction or the rearrangement of the molecules of the metal in crystalizing after casting. There is some distortion in more or less extensive castings, it is true, but if you back up your facing first with a very thin piece of pure gold, I do not care whether it is a porcelain facing with fine points, such as were shown on the screen, or whatever type of porcelain tooth it is —if you will first adapt thin pure gold to that tooth, and then make your casting against that, whether your wax expands or the investment material expands, does not matter, because the porcelain tooth facing will always go to place. I think that a layer of thirty-six or even thirty-eight gauge pure gold will control the warpage due to the change of the molecules in the crystallization of the casting; so that you will not have to pay any attention to the room temperature or to the expansion of the wax, or to the necessity of the expansion of your investment material prior to the casting. That is the result of my experience.

Dr. Knoche spoke splendidly in my opinion with regard to the use of saddles. Saddles have been more or less criticised and to some extent condemned for a long while, and principally because of the reasons which he mentioned, that the mobility of the saddle or of the riding of the saddle upon the soft and more or less elastic tissues will stimulate resorption. I think perhaps a great deal of that comes from the early statements of our dear old Dr. Haskell, when he said to us that the wearing of vulcanite dentures stimulates resorption of soft and hard tissues, and that a greater degree of resorption would take place under the wearing of vulcanite dentures than under the wearing of metallic ones. I think Dr. Knoche has given you the correct solution of that. The soft tissues under that saddle should take up the work of the saddle, and the teeth that the saddle supports, thus relieving the abutments of any unnecessary stress, giving them practically only their own work to do, with the addition of support or fixation of the structure. And if the adaptation of that saddle to those soft tissues contiguous to it or with it is uniform, there will be no stimulation to resorption in my judgment. The trouble is, as you have been told, that models have been scraped and saddles have been sunken and embedded down into the scraped areas, which have not been scraped uniformly, and we would have more pressure upon one surface than upon another, and naturally resorption would be stimulated. But if the saddle is made to fit the tissues upon which it is made to rest, and then if it is firmly embedded into that tissue before it becomes permanently fixed or attached to the attachments which are to support it, then the pressure of the saddle is uniform at all times, and that saddle will take up the work of the teeth which it is tended to support, and will not cause in my opinion any resorption of the tissues. I have observed that after a number of years of very close observation.

At the last meeting of the Chicago Dental Society when this subject was discussed, I spoke of that and told you how the impressions might very easily be taken under pressure in all cases, mechanical pressure applied by the jaw itself, whether it be the upper or lower, and as that is in print, I will not go any further into a discussion of it.

I was very glad to hear Dr. Knoche give you a word of caution in regard to the possible disadvantage of Dr. Chayes' parallelo-drill. He finds it seems the same objection to it that I found, and I was afraid to use it, and I fear those who may use it will encounter just the difficulties to which he calls attention, that is the danger of perforation of the roots. The parallelometer is all right, it could give you parallelism between your posts and tubes and roots, but when you go to drilling with this mechanical appliance you have not any control over it after you start, and if there be a slight constriction of the root with which you are not familiar, a perforation is the usual result before you know it; while if you go at it in the manner suggested you will avoid that, and still it will be possible for you to have good parallelism between the parts.

I was very glad to hear him speak as he did concerning the tube and split post attachment for removable structures. I think one of the greatest disappointments of which I remember, along that line was that Dr. Roach read a paper which was followed by Dr. Coltrin, and neither one of them said a word about the tube and post method of attachment. I could not understand how they came to overlook it, and I called attention to it when Dr. Coltrin read the paper at the state society, for in my opinion it is the most useful method of attachment for all forms of removable structures, when applied not only to the anterior teeth as suggested by the essayist, but when applied to any single rooted teeth, and that gives you the lower bicuspids and the upper second bicuspid together with the anterior teeth. If you will follow carefully the technic that is necessary in paralleling and in applying the attachment of post and tube, which has been suggested by Dr. Knoche, I am sure your experience will be the same as mine, that you will find it to be the most useful form of attachment upon which you can depend and rely, as applied to any single-rooted teeth; perhaps not the four lower incisors, because oftentimes they are not large enough and you must have a root large enough to take in the tube and a post of sufficient size to assure strength.

One other thought. I abandoned split posts a couple of years ago because I found in many cases that one of the later halves would sometimes break off. In several cases it did break off and the patient would come back and only have half a post left, notwithstanding the fact that the lower or basal half had previously been soldered, and they had been drawn down together. Whilst I am not familiar with these elastic alloys to which reference has been made, for the last two or three years I have been using non-split posts of 14 or 15 round gauge iridio-platinum. You may ask me how they can be tightened. The slightest bend you can possibly give to that post will tighten it and not cause crystallization of the metal. And in using one single post you have the maximum of strength, twice the strength that you have in a post composed of two lateral halves.

Dr. F. E. Roach :

The essayist took up the subject of malocclusion and its correction in pyorrhea, and other lesions that occur from these conditions. There is no question but that we are entirely too negligent in the matter of carefully studying these conditions and discriminating between the different forms of appliances that may be employed, we do not take these things into consideration to the extent that we should.

Then the essayist took up the subject of gum irritation from improper adaptation and fitting of our crown abutments, and while I do not agree with Dr. Knoche in his condemnation of the banded crown altogether, I think that his position with reference to the bandless crown is ideal, if it can be carried out with the degree of accuracy that he maintains it should be done. But regardless of the fact that many years ago when I was a young man I took this attitude that the bandless crown was the only form of crown to put on, and I think I made the statement that I had no use for a crown with a band on it, at that time, yet as the years have gone by and I have seen the failure of many of these ideal bandless crowns, I have come to the conclusion that I had better make a few of the banded crowns, and today I am making a good many bands.

Then Dr. Knoche makes a most radical and emphatic charge against fixed bridgework, on which I cannot quite agree with. I still believe that there is a place for judiciously selected and well constructed fixed bridgework, and you all know that I have been largely in favor of removable appliances during practically all my professional career; and yet I am not so radical—I am a radical conservative, while Dr. Knoche is a radical-radical on this subject of removable bridgework. He is a master in his work, but to assume that all of us can do this class of work along the lines which he has indicated is too much to expect, and I do not believe that it is the fair thing or proper thing, or the proper teaching to be promulgated. I do not believe Dr. Knoche himself intends that this impression should go out, that this class of work is to supplant all our fixed bridgework. This radical procedure of devitalization and excising teeth cannot be adopted as a system of practice. The method he outlines is so very limited in its application that it becomes a method of practice that can be limited to a few specialists who are treating these extensive cases of post-pyorrhea, where there is extensive pyorrhea and the necessity for extensive correction of malocclusion of the teeth, etc. I do not believe that Dr. Knoche intended that it should be taken as a system of practice. There are so many cases in which the better practice is that of conservatism, to conserve the natural teeth as they come to us and put in some other form of appliance which will obviate the necessity of devitalization and destruction of portions of the teeth. So I take issue with Dr. Knoche, or rather I would call the attention of the younger men to the fact that I do not believe that Dr. Knoche intends this idea to prevail that it is a substitute for the many other valuable appliances that we can resort to as a means of supplying these missing teeth.

I want to emphasize what Dr. Knoche referred to, with reference to a more careful study of these cases, of making study models, and of making more careful diagnoses, in order that we may choose the method that will be more suitable for the case. I think we are entirely too careless in this respect.

Another objection which I seriously raise against this method of the tube and split pin plan of anchoring removable appliances is this: I will say that while I recognize fully the value of this method of anchoring appliances, I realize at the same time their disadvantages, and I believe that the advantages are overbalanced by the disadvantages. They make a very strong and secure appliance, but it is my judgment that in general practice the danger of perforation of roots when placing these tubes is too great to be generally adopted.

And furthermore, a removable appliance is employed for sanitary reasons, and to have a tube put down into the root of a tooth of the size that is necessary to carry a pin of the required strength, means that you will have a pocket surface that is almost impossible to keep clean, and in the case of appliances of this kind that I have seen, I can smell them before I get near enough to the mouth to see them. I insist that such an appliance is not sanitary. I would be glad to see any of these appliances made in this way that can be kept clean easily by the patient, and you all know that regardless of the fact that we make these removable appliances and point out to the patient their advantages and preach and hammer into their minds the importance of keeping them clean, even though they be practically self-cleansing, you know how many patients will keep them clean. Very few of them. I myself have a hard time to get them to keep even those partial plates clean that are practically self-cleansing. The people will not do that, and yet we are saddled with the responsibility of keeping the mouths of our patients clean. My experience is that regardless of how well we do our work it is difficult to obtain the co-operation of the patient in this campaign of prophylaxis and sanitary bridge construction. If you can have the split pin above and set on top of your coping, and have the tube open at both ends so that it will be practically self-cleansing, so that the patient does not have to ferret it out with a probe or a wisp of cotton, then it is all right, so that is my explanation of the reason why I do not favor this form of appliance.

All I have to say further with reference to removable artificial appliances is, let us all try and do more of it and do it better, and more conscientiously. Let us be more conservative in our treatment of the natural teeth.

Dr. Victor Fuqua:

The essayist is to be congratulated on the splendid paper he has given tonight. He has set up an ideal standard for himself in his conception and creation of removable bridgework. His beautiful technique should be an inspiration to all of us who are working along these same lines. To succeed we must have an ideal set up in our minds and hearts and faithfully work toward this end; ever remembering that we are working with human hands in our endeavor to replace Nature's handiwork. No matter how perfect the finished denture may be, it is a poor substitute when compared with Nature's masticatory units.

Our effort is to simulate Nature as near as possible and one must of necessity fall far short, even with our ideals. Without a high standard set up as our guide we fail entirely. The field that invites us into removable bridgework is broad, especially as it is viewed as post-pyorrhea procedure.

The form of abutment attachment has always been a big problem; but it seems to me that Dr. Knoche has solved it most admirably with his method of using the split post. Dr. Goslee spoke of using the solid post, which is very satisfactory in my hands, and I was glad he explained his method of using it.

I have no criticism to make of Dr. Knoche's paper except that he gives us the impression that all fixed bridgework is insanitary, and all shell crowns a menace to the teeth that bear them. The fixed bridge and shell crown are standard procedures; and, properly constructed, I am quite sure they will measure up to the same standard hygienically as the removable bridgework.

Dr. Dittmar:

I want to very heartily second, in every respect, the good things which Dr. Goslee and Dr. Roach have said about the two eminent gentlemen who have read papers here this evening, but in addition I wish to say a few words, because like Dr. Roach I cannot entirely agree with what Dr. Knoche said regarding the tube and post method of anchoring removable bridges or partial plates, as being the best form of attachment for removable artificial dentures. As far as the mechanical attachment is concerned, I heartily agree that this method will insure a secure mode of anchorage, but I endorse most emphatically what Dr. Roach said regarding its being an unsanitary proposition, and that it is hard to keep clean, regardless of what the patient may do. In addition to this, there are other objectionable features which cause me to take issue with the essayist.

Take, for instance, a case where the eight lower anterior teeth are in position, and you are going to supply the missing molars with a lingual bar appliance; now if you are going to do as Dr. Knoche suggests: excise those second bicuspids at the gum line, anchor copings and tubes to the roots, and make dowel crowns, which are to be a part of the appliance, what is going to result? First of all, these crowns, which are removable crowns, should be so constructed and placed as to be in good contact with the distal of the first bicuspids. You have in each root a post snugly fitting into the tube. These posts are a part of the appliance, the saddles carrying the molars extend distally. In masticating, much force is applied to these artificial molars, possibly from 20 to 50 pounds. Under masticating force there is great strain on the anchor roots and as the distal part of the appliance gives under stress, contact is broken between the removable crowns and the distal of the first bicuspids. And what then happens? There is a separation, loose contact, irritation and inflammation of the septal tissue, and a "pocket" resulting between those teeth, and eventually you have just the thing which you are trying to avoid.

So much for that phase of the post and tube anchorage.

Next I wish to consider the subject of tissue compression. Taking an impression, making a model, and constructing a saddle to fit an area in the mouth, and then taking the "bite" with masticating pressure is undoubtedly good procedure, to a certain extent, but first of all, the impression should be taken in a manner to compress the soft tissues and with the mouth in its proper relation; or the position in which the alveolar ridges are going to sustain stress at the time of mastication. You probably grasp that I am speaking of the Greene-Supplee method, which is a very excellent method. An ordinary modeling compound impression made in a minute or two by pressing the compound in position once to get an impression is as a rule a very poor thing.

But let us follows up this subject a little farther. If I understood Dr. Knoche correctly he said, in substance, that a saddle made properly, from a perfect impression, placed in its right position in the mouth, and under biting stress pressed firmly against the soft tissues, in which relation it must be soldered to the removable crown, would when the appliance is worn by the patient produce *no change* in the form of the alveolar ridge, because the action of this saddle as it compresses the submucous tissue under stress and releases it when stress is withdrawn, as in masticating—this up and down motion of the saddle produces a stimulus to the blood supply of the alveolar ridge and as a consequence no change results in the form of the ridge; in other words, it remains permanently in an unchanged condition.

If this is a fact, "well and good," but personally I do not believe that such stimulus will prevent change in the form of the alveolar ridge, regardless of the fit of the saddle. But going a little farther, what happens? Remember, the posts of the crowns are a part of the removable appliance. These posts must move up and down in their tubes as the saddles move up and down under masticating stress. This will cause wear of the posts and tubes and also irritation of the gingival tissue surrounding the roots carrying these crowns. Also this pumping motion will stir up those foul secretions in the tubes that Dr. Roach referred to, which will be forced out to contaminate the saliva and food in process of mastication.

I agree thoroughly with Dr. Roach from the standpoint of conservatism, and I say again, as I have said before, that to me there is no attachment which has the advantages of the Roach attachment, from the standpoint of conserving the life of the tooth to which anchorage is made. It is a ball and tube proposition, there is practically no strain, regardless of the saddle settling, and regardless of the amount of pressure that is put on the distal part of the appliance, where there are no natural teeth distally to take the strain. I firmly believe that it is the most practical form of attachment from the standpoint of getting the longest service out of the tooth to which the anchorage is made, but even this attachment with all its good points is by no means of universal application, and often the tube must be modified by soldering to it a contact spur.

In closing, I will say I have seen a number of extensive cases of removable bridgework which were treated by Doctor Knoche, and I will "take my hat off" to him for nicety of fit and beautiful workmanship. He is a master of technical detail and produces finished results.

Dr. Knoche (closing):

I want to reply formally to what Dr. Dittmar said. If you are depending on a saddle driven into the soft tissues, you have leverage first before the abutment tooth begins to get into the work, and you have malocclusion in my opinion. I think he has a slight misconception of my idea in regard to the movement of saddle and the abutment tooth simultaneously. I believe Dr. Chayes is correct in principle when he states of one end of the appliance being rather free in movement in order to give to the abutment tooth their individual load, their normal stress. We do not depend on a split pin moving within a cylinder. We depend on the ratio—and this is largely surmised—we depend on the ratio of settlement under pressure, under mastication, between the periosteum or the overlying soft tissues rather, and the bony understructure, and that ratio of movement permeates every movement of the tooth in its socket. I think it is correct to say that the tooth with no strain or stress upon it receives no stimulation, and I believe the movement of the tooth in its socket can be so arranged as to be equal to the movement of the saddle in compression under mastication.

As to my observation in regard to these lower dentures, these lingual dentures, I have placed many of these, and yet I have to see a case made under the outline that I believe is correct in the placing of saddles and all, where we have lost normal contact with the adjoining tooth. I do believe that unless the saddles are placed by some such method as Dr. Goslee has given us, the mechanical pressure, the pressure of the saddle under its normal stress or under the stress to which it is to be subjected, that then we do have exactly that condition which was spoken of.

Let me clear up one statement that I think Dr. Dittmar had a misconception of, and that was that I take a simple modeling compound impression, that those impressions are taken under the fine method that Dr. Greene gave us, and lately I have had them taken with the minimum bulk, so that we have as little abnormal condition of mastication as possible, and we take them under masticatory stress, the closed mouth arrangement.

There are some conditions in some cases where it is necessary to watch very closely this matter of the saddle in relation to the abutment tooth, and in some of them I always make provision for an easy method of replacement of the saddle, or a readjustment.

The matter of leverages is largely a matter of the study of occlusion, and I believe our leverages are minimized greatly by means of a study of the true principles of anatomical occlusion. For this I am greatly indebted to Dr. Matteson, with whom I was associated for a number of years, and was inspired in that way.

What I plead for is the consideration by the schools of a more comprehensive study of the underlying conditions that are to be considered in this work.

In regard to Dr. Roach, let me say that I do not condemn a banded crown; I do not say that a banded crown cannot be adapted, but I do say that the vast majority of men pay no attention to the fundamental principles of root preparation, which have been so beautifully brought out by Dr. Orton, and the very operation which can be carried on, and the ease with which the average gold crown is put on—I am talking of the average which is by no means a correct dental operation, I believe it is this vast majority, this great mass of the operators, who are doing the injury and who are bringing this system of practice into disrepute.

If you could all see the technic that Dr. Orton could give you on root preparation and could follow it as faithfully as it can be done, I do not believe there would be very many criticisms on the banded crowns.

As to fitting the coping, it is not a bandless crown. I could read you a paper on the physics of this matter, but I do not believe I will take that up now. It has the effect of a band, particularly in those cases where there is abnormal stress, that bevel on the lingual side particularly is cut very high, and my only thought is the development somewhere on the root surface of a well defined angle margin. Now to fit a band to that would be the same as to fit a coping. In my hands the coping seems to be more easily manipulated than does the band. You can, however, fit a band as freely and as easily as anything else.

Dr. Roach has instilled a great thought in my mind, and brings out the thought that I am young. I feel that it again comes back to the matter of occlusion and articulation. Certainly a root would split with any sort of a band or anything you could put on it if it was receiving a stress that was not taken care of and not neutralized by a full occlusion. I think a good deal of bugaboo on the matter of split roots has been brought about by this fact that we have been putting abnormal stress on the tooth that has been crowned. I do not mean to say for one moment that removable bridgework is to supplant fixed bridgework. I do a great deal of fixed bridgework. There are cases where I would feel criminally liable if I devitalized a tooth. Take a short space, for instance a first molar and the first bicuspid missing; I would never think of devitalizing and putting on removable bridgework on three roots to supply two missing teeth; I would certainly use some type of fixed bridgework, and conserve the vitality of the teeth.

I do not believe that the worker on pyorrhea prophylaxis is justified in spending hours of his time if the patient will not do his part. I have yet to see where some attention has been paid to keep the mouth clean, where the tubes themselves have afforded any great amount of uncleanliness. The principal materials that get into the teeth are the normal secretions of the mouth. I have never found them full of debris unless the patient has foolishly taken the appliance out of the mouth while masticating. I usually provide a bulb syringe for the patients and have them syringe these tubes out, and an intelligent patient will take very good care of that end of it; and as far as the removable portion is concerned that is easily kept clean. I am going to be loaded for bear the next time that is brought up, and I will go into the bacteriology of it very fully.

Now as to the progress made. I recognize that you all know that the men who are doing the advance work and the clinical work over the country, the men who are doing the teaching in the country are a very small minority when we consider the entire dental profession as a whole, and I do not believe that the same progress has been made in our crown and bridgework in our profession as a whole as has been made in any other department of the work.

As to the matter of attention to minutiae and detail in casting, these are very tedious and are very satisfying as to their results. I agree with him as to the manipulation of the wax in regard to the facings. I never yet, even with a device in which I can expand my wax, and with the most careful manipulation that I have been able to perform, have I been able to care for the Goslee tooth and get a result that I was at all or entirely satisfied with. I believe that with the Goslee tooth there can be a modification made aside from the forms that they come in, and if I were the father of a tooth as important as the Goslee tooth, I certainly should insist on some tooth forms, but I think there can be a modification made of the crown that would greatly add to its strength, and that is that instead of beveling a shoulder on the mesio-distal lingual, if he will prepare that to a bevel that finishes at no particular point, and to which the casting or the backing can be burnished, he will greatly add to the strength of that tooth. I cut all of the Goslee teeth that I use in that way.

In regard to the difference between the split pin and the solid pin, the difference is this: with the split pin made of elastic metal, it is possible to open the pin in the middle and again close it at the end, thus making an ellipse in the middle, and that is where you have the contact, it acts rather in that region as a ball and socket. With the binding or solid post you have no give to the post, and either the post is unduly worn or the tube is unduly worn, and I believe it is important to conserve the life of the metals in friction as long as possible, and I do believe that we get a far greater amount of wear from these solid posts. I have been discouraged many times with the fact that one-half of the split pin may break off, and with the old cast metals I have had that happen frequently, so that it was very discouraging; but with the new elastic metals which I have subjected to every sort of test and strain, it is very hard to crystallize, and it is very uniform in alloy, and I believe it has overcome that difficulty. I even went to the trouble of trying to work out following Dr. Corcoran's lead, a nut which would be incorporated in the casting, but that had to be so fine that it was not practicable.

In regard to the wearing of a denture hastening resorption, I am very much of the opinion that it does just the opposite. I have placed in the mouths of patients, where they have had a recent extraction, saddles made after the manner which has been outlined, and I have been discouraged with the lack of resorption under that sort of saddle; several of those cases have added to my theory, and I believe that the right kind of placement of those saddles stimulates and invigorates the tissues and prevents resorption.

I was very much delighted to have Dr. Orton take up the matter of our profession being the scapegoat of the medical profession. A case came to me some time ago which had been to that very famed institution at Rochester, the Mayo's. The man had suffered for fourteen or fifteen years with a leaking heart valve, the mitral heart valves were leaky. He had had this diagnosed time after time in this country and in Europe, and they would tell him always what the trouble was. He found nothing which would lead to it, until he went to Rochester, and there they radiographed the teeth. Before this they looked the mouth over and decided that the upper four incisors, the laterals and centrals were past suspicion, that they were normal. So he had in his mouth some very poorly made fixed bridge work, with a good deal of irritation and some pyorrheal pockets. They radiographed those teeth for pyorrheal pockets and handed him a report on his teeth, and told him that very likely the condition of those teeth was the predisposing cause of his heart infection; that some man had placed in his mouth some abominable bridge work which had caused the pyorrhea, and he had an infected heart valve as a result of it. When he came to me,—he met a physician friend of his in Rochester who suggested that he come in and see me on the way home,—and when he came in he told me that they had radiographed the teeth and found pus pockets, and I subjected him to the radiographer and had every tooth in his head radiographed. They had made a radiographic examination of all the teeth excepting those four incisors which were above suspicion. They blamed the dentist for these faulty operations and for his condition. My radiographic finding was that two of the incisors out of the four were abcessed. The case history was that one of them had abscessed sixteen years ago, possibly seventeen, while in New York. He had been in the oil business and while superintending the drilling of a well a timber had fallen and a small iron bar had been knocked up and hit him in the mouth. He paid no attention to it, and some months later while in New York his face began to swell terribly, but knowing no one there he sought no advice. The abscess broke as he said one night, and he had been comfortable in that region ever since. Within a year and a half subsequent to that he began to develop shortness of breath on physical exertion, and he was going from bad to worse. The cultures which were made showed pure strains of streptococcus and staphylococcus. The dentist had nothing to do with that except he was not consulted when it first happened, and their finding, the finding of that eminent body of men, was that the dentist was responsible.

After a comprehensive study of mouth conditions and of their roots and predisposing factors and devitalization and things of that sort, I believe that the root preparation is the first and primary consideration.

In regard to root canals, I want to say that that is one thing over which I have been puzzling and worrying a great deal. I believe I have devitalized more teeth in the past than I should, and with the theories of the autogenous origin of abscesses becoming rather prominent, it is going to be quite a question as to what we are going to do, and that is a subject that is in a field entirely by itself.

NORTHERN ILLINOIS DENTAL SOCIETY, TWENTY-EIGHTH ANNUAL MEETING, HELD AT FREEPORT, ILLINOIS, OCTOBER 20-21, 1915.

Discussion of the President's Address.

Dr. M. D. K. Bremner, Chicago:

Mr. President and fellow members of the Northern Illinois Dental Society:

Our president has taken up very important phases in our practice and the opportunities that confront us. If you reflect a moment you will see that the underlying ideas, the very basis of the whole address, can be expressed in just one word: thoroughness.

Some pulpless teeth and some conditions of the gum are responsible for certain diseases, but that does not mean that teeth shall be sacrified indiscriminately on the physicians say-so. It is our opportunity to protect the patient from careless diagnosis; we are more competent than the medical practitioner to judge which teeth are apt to be the troublemakers, but let us call in the X-ray machine to our aid; in short, let the diagnosis be thorough.

Again after all the arguments pro and con are sifted down, emetin does seem to have some favorable effect on pyorrhea; but we must guard ourselves and others from making exaggerated claims for it. Here again we must be thorough. We should be thoroughly familiar with the drug and know its qualities and limitations and lose no opportunity to acquaint those who come to us with the exact facts. Already I think a great deal of harm has been done by some careless and over-optimistic men, who made the people believe that a few injections of emetin will cure pyorrhea for good and forever, and that anyone can do it. Therefore, of course, some people began to think that pyorrhea is not a serious affliction and treatment can be neglected with impunity.

The most important note, however, did Dr. McWethy strike when he calls attention to the necessity for thoroughness and a minute knowledge of the things we use in our daily work. I am glad he brought up this point. It ought to be talked about more often. It is to the shame of the dental profession that so many secret preparations are being sold in the supply houses, too many dentists are buying and using them in their practice without having the faintest idea what they cantain. Think of it: we, a branch of the medical profession, men who are supposed to have at least an acquaintance with chemistry, materia medica and therapeutics, purchasing patent nostrums, like any ignorant layman, with this difference, however, instead of taking them ourselves we use them for others, on the people who trust fully deliver themselves into our hands. Imagine, what our patients would say if they know that we put drugs in their mouths the nature and composition of which we are entirely ignorant. Supposing something went wrong could we tell our patients that Mr. X. who sold us the stuff is to blame, because he said it was all right?

The medical profession is not guilty of anything like this. I still have to see a physician's sample that does not bear the contents on its label. The medical man is never asked to prescribe or use any preparation without a full knowledge of its ingredients.

I am firmly convinced that we can get all the necessary therapeutic effects with the simple and well known medicinal agents and at a much smaller cost, however, if we want to use proprietary medicines, let us insist on knowing their composition or else refuse to buy them.

I heartily agree with our president that we need malpractice insurance, not so much to protect us from suits for actual mistake, but to shield us from the professional troublemakers. Very often dentists are dragged into court for no reason whatever, and no matter what the outcome there is always the lawyer's fee and lots of valuable time lost. These people will think twice before filing suit when they know that we are organized for defense. I also agree that if found necessary a little additional cost should not stand in the way of the plan, let us have the kind of protection that protects, in other words, let us have efficiency.

Dr. George T. Banzett, Chicago:

I wish to congratulate the President upon the thought and care which he has devoted to his address, and also, upon his choice of subject.

It is indeed our opportunity and we, as a profession, should realize it to the utmost. Our medical friends are awakening to the fact that the oral cavity is responsible for many of the illnesses which beset us, and they are looking to us for corrective treatment. We must be prepared to give it, and that is part of our opportunity, but, as I see it, the lesser part, for our treatment should be not only corrective, but should extend to the greater field of prophylaxis, where we justify ourselves as benefactors of mankind.

Nowhere does the old saw, "An ounce of prevention is worth a pound of cure," apply so aptly as in dentistry, and we must realize it fully and practice it at every opportunity.

We know that were it possible to keep the teeth absolutely clean they would never decay, and there would be no pyorrhea. I impress upon every patient the fact that prophylaxis is the most important work in dentistry today, and in all my treatment of pyorrhea the first requisite is tooth cleanliness. Each and every tooth must first be absolutely freed from deposit of every kind, both upon the exposed and root surfaces. It is possible to attain to such an approximate condition, at all times, by first training ourself, and then training the patient. I would that every dentist in the world had a set of Carr scalers, and the knowledge to use them; then we would see the dawn of the dental millennium, for each herald becomes a herald of the new work.

Prophylaxis does quite as much for the dentist as for the patient, since a realization of the value of prevention eliminates ill-fitting crowns, inlays which extend beyond marginal walls, unfinished or badly finished fillings, injurious bridges and plates.

Emetin has been a disappointment to many both within and outside of the profession and yet it may have accomplished much good in that it called attention to teeth which could be saved; and while I very much doubt that the emetin itself is responsible, yet I feel that the "emetin agitation" is responsible for the saving of many teeth, which otherwise would have been lost.

It gives me much pleasure to note the essayist's position upon the suits for malpractice, which are constantly being brought. They are in the majority of instances simply for blackmailing purposes, and were the people given to understand that the National Dental Association was back of, and protecting, the individual dentist, very few suits would be instituted.

I regret exceedingly that circumstances make it impossible for me to be with you personally, and have already promised myself that I will surely be with you next year.

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EDITORIAL.

THE WIDENING SPHERE OF DENTAL JOURNALISM.

One of the most hopeful signs of the times in dentistry is the growing tendency toward the establishment of dental journals. This relates particularly to journals published by state dental societies, as organs chiefly of the organizations which issue them. It has become so common for a state society to publish a journal or bulletin, that the society which does not do this is almost the exception. We look upon this as most promising for the future welfare of the profession. The more men read the better informed they will be, and the sooner the habit of reading will become fixed. State society members may be counted on to read a periodical published by their own society when they will read no other, and after they have read their own for a time they begin to develop a desire for a wider course of reading, and eventually they take to the larger and longer-established journals.

We have been charged with being a profession which did not read extensively, but if this has been true in the past it can no longer be laid against us. No publishing house or dental society can go on issuing a journal that is not read, and if this be true there must be many readers in dentistry. We doubt if there is any profession or calling of equal numbers which issues monthly or annually so large a number of periodicals as does the dental profession. Not only this but we do not recall a time in our history when readers were more alert in sifting the significant things in our literature than they are today. They are surely reading more than ever, and while much of the matter published must be rated as more or less ephemeral yet the main thing is to establish the reading habit. When this is once formed it will demand in due time the best there is in our heaviest periodicals, and we shall no longer be subjected to the implied reflection that the men who possess the D. D. S. degree are merely represented by a "badge of partial culture."

THE EDITOR'S DESK.

ANSWER YOUR LETTERS.

I was talking the other day with a man who has recently come in contact with dentists in a business way, and his first comment was that dentists as a rule seldom answered letters promptly, and more often they did not answer them at all. He seemed to consider it a serious reflection on the profession and I agreed with him. I could muster no apology for men who ignore so patent an obligation as this, and I have heard this charge made so many times that I would willingly write the letters of the whole profession if I were able to do so rather than have this stigma attach itself to our members.

In the terrible pressure of correspondence that some of us have it is not always possible to answer a letter the same day it is received, but it should be possible to answer it in a reasonable time, and it is always possible to answer it some time. The failure to notice a letter in any way, is the equivalent in many instances of turning your back on a man when he asks you a question. No gentleman would do this unless the question were altogether improper or impertinent, and yet many dentists in their carelessness or utter disregard of common courtesy will ignore a letter when the contents are in every way legitimate and worthy of the most careful consideration.

Somehow I am always hurt when the good name of my profession is questioned in any way, and in this matter of correspondence I have long felt an appreciable embarrassment when business men—and by this I mean men who understand the common usages of business affairs and business obligations—frequently complain of the utter disregard of members of the dental profession to the simple duty of answering letters.

We do not want to gain this kind of reputation among responsible people. If we are to take our proper place in the great forward movement of human uplift, and work side by side with intelligent and cultured people we must have a higher regard than many of us have for the ordinary amenities of life, and we must not by our carelessness or negligence set ourselves aside as men with no sense of propriety or moral obligation.

The next time I learn of one of my fellow-practitioners failing to answer a letter, I shall probably go to him, and on my bended knees beg of him to reform, or possibly, what might be more effective, I shall swear at him.

BOOK REVIEWS.

American Illustrated Medical Dictionary (Dorland). A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Science, Nursing, Biology, and kindred branches; with new and elaborate tables. Eighth Revised Edition. Edited by *W. A. Newman Dorland, M. D.* Large octavo of 1135 pages, with 331 illustrations, 119 in colors. Containing over 1500 more terms than the previous edition. Philadelphia and London: W. B. Saunders Company, 1915. Flexible Leather, $4.50 net; thumb index, $5.00 net.

The previous issue of this work appeared in 1913, since which time so many additions have been made to the nomenclature of medicine, particularly in laboratory and clinical tests, that an appreciable enlargement of the book has been made necessary. The present work has been brought to date and it continues to maintain the high standard of excellence set by previous issues. A conspicuous feature of the book is the colored plates some of which are exquisite in design and production. It is also a very convenient book to consult, for while necessarily somewhat bulky its general flexibility renders it easy to handle. The mechanical and typographical character of the work is well up to the reputation of the publishers which in itself is sufficient to commend it to the consideration of every one who needs such a book.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Articulating Artificial Teeth:—In articulating teeth do not forget the difference in conditions between the solid natural teeth and the movable plates. The two do not coincide and the natural articulation cannot be followed only to a very limited extent.—*L. P. Haskell, Chicago.*

Cementing a Gold Inlay:—After setting a mesio-occlusal disto-occlusal, or occlusal gold inlay, place a large cotton roll over the inlay and direct the patient to bite. The cotton roll will keep the cement dry until it sets and permit the operator to turn his attention to other matters for a few moments.—*Albert E. Converse, Springfield, Ill.*

Waste Cotton Receptacle:—Get folded tablet boxes (No. 2) about 1⅛x2x⅝ inches, cost about $1.30 per thousand. Bend a piece of tin or any other thin metal to make a clip that these will slip into and fasten it to under side of your bracket table so that when the box is in place it will extend about a quarter of an inch beyond edge of table. When box is in place punch a hole in end of it with your cotton pliers and it is ready for use. Have a clean one for each patient.—*E. T. Evans, Decatur, Ill.*

To Facilitate Cementing a Gold or Porcelain Inlay:—Mounting the inlay, in its proper position to enter the cavity in the right direction, on a tapered orange-wood stick will greatly expedite matters when it means much to both operator and patient. It avoids all possibility of confusion that so often arises when using tweezers or fingers to place inlay in cavity while both of the latter have been smeared with cement, thus causing more deception as to position.—*W. D. N. Moore, Chicago.*

Extracting Upper Teeth and Lower Teeth at the Same Sitting:—Where it is necessary to extract teeth or roots from the superior maxilla and the inferior maxilla it is always best to operate in the inferior maxillary region first. By so doing the field of operation will not become obscured, whereas if you operated in the superior maxilla first the inferior maxilla and the floor of the mouth would be entirely filled with blood and render the operation complicated and difficult.—*Walter G. McGauley, Boston, Mass.*

To Polish Rubber Dentures:—After the plate is filed, scraped and sandpapered, instead of the felt cone use a cone made of a wine cork, one end of which is screwed into a chuck and the other end rounded with a file while the latter is revolving. On this use pumice in which has been incorporated some emery dust moistened. This cuts much faster than pumice alone, and will take out the scratches left by the sandpaper very rapidly. Follow this with pumice without the emery, then use whiting moistened with ammonia.

If a fine polish is required employ prepared chalk and ammonia after the whiting. The commercial whiting contains considerable grit, and while it will polish it leaves many shallow scratches which the fine chalk eliminates.—*F. J. Patterson, Mendota, Ill.*

Warning to Users of Rubber Suction Valves:—I recently had a patient under my notice who was at the same time under medical treatment for inflammatory morbid conditions of the middle ear, throat and posterior nares. Examination showed a rubber suction valve that had been worn for some time, and that had caused a mass of hypertrophied tissue immediately over the anterior palatine canal. After removing valve and cauterising and reducing hypertrophied tissue the symptoms immediately subsided. I believe that rubber suctions, air chambers and other such contrivances for retaining plates are seldom if ever necessary with modern methods of taking impressions. Further that such contrivances cause much more inflammatory conditions of the surrounding parts than is generally supposed.—*A. G. Salisbury, Takaka, New Zealand.*

A Simple Method of Restoring Badly Broken Down Walls of the Six Anterior Teeth Labially or Lingually, Using the So-Called Enamel Fillings, Having Very Little Polishing to Do in Finishing:—Prepare the cavity for the filling as usual. Take a piece of modelling compound the size of the end of a thumb. Soften slightly on the *outside only* and press up against the cavity and adjoining teeth. Allow it to harden and remove. Trim off the portion which protrudes into the cavity. Next pass a celluloid strip around the cavity, and replace the piece of modelling compound to original position. Hold firmly with the finger while the filling is inserted with the other hand. Allow the filling to harden and remove the compound and strip. With a little practice and skill in manipulation a good filling may be made with very little polishing.—*E. L. Burroughs, Edwardsville, Ill.*

Attempting the Impossible:—When a full upper denture is being constructed while there are still some natural teeth in the lower jaw there are certain conditions which make it imperative to extract some of the natural teeth even though the patient is quite likely to enter a protest. If on the lower jaw there are no natural teeth back of the cuspid on one side while on the other there remains a bicuspid, or possibly there are two, there is absolute necessity for the extraction of the bicuspids. The reason is that the artificial teeth on the vacant side will settle so that the pressure comes on the anterior teeth where it should never be. This will often happen in six months. By extracting the bicuspids uniformity of pressure is established on both sides, and then by setting the artificial teeth long enough to leave a good margin for settling the greatest service will be obtained.—*L. P. Haskell, Chicago.*

Petri Dishes for Canal Points:—There has been much said lately concerning care in keeping and handling gutta-percha canal points. The little boxes in which they are sold are not only unsightly and unsanitary, but they offer no means of sterilization or maintaining in a sterile condition. The gelatin tubes are likewise inappropriate. The little vial is inconvenient, especially if both hands are required for removing the stopper. These are some of the very obvious reasons for the search for a better method.

In bacteriological laboratories are found Petri dishes. little, shallow, thin glass dishes, with loose glass covers used for holding culture media while growing bacterial specimens. The small size Petri dishes, about two inches in diameter and one-half inch deep, are found to be a very efficient, convenient and attractive container for canal points.

The points may be covered with alcohol or any sterilizing solution. When required the dish may be placed on bracket table; it cannot fall over to spill contents; its cover never sticks, and may be easily removed or replaced with two fingers of one hand.

In the larger size Petri dishes burs, broaches and reamers may be kept in a ten per cent lysol solution.—*D. N. Lewis, Lake Forest, Ill.*

MEMORANDA.

AMERICAN SOCIETY OF ORTHODONTISTS.

The American Society of Orthodontists will hold their annual meeting in Pittsburg, July 20, 21, 22, 1916. The usual high standard of the meetings of this society will be maintained. All those interested in Orthodontia are welcome. Any communications regarding the meeting may be addressed to Dr. F. M. Casto, 520 Rose Bldg., Cleveland, Ohio.

IMPORTANT INFORMATION FROM THE DENTAL PRETECTIVE ASSOCIATION OF THE UNITED STATES.

At the annual meeting of the Dental Protective Association of the United States, held at the Hotel LaSalle in the city of Chicago, on Monday, December 20, 1915, the secretary was requested to prepare a plain statement for publication in the different dental journals, giving such facts as would be of general interest to the profession, and setting forth the status of the members of the association with reference to the pending Taggart litigation.

NEW LIST OF MEMBERS IN GOOD STANDING.

During the past year the board of directors revised the list of members, eliminating from the new mailing list the names of those who were known to be dead, out of practice, or who did not pay the assessment levied in about 1898. On December 10, 1915, the latter were notified and given an opportunity to place themselves in good standing in the association by paying the $10 assessment. A few took advantage of this and remitted the amount; those who did not do so were dropped from the list.

NEXT TO THE LARGEST DENTAL ORGANIZATION IN THE WORLD.

The new list of members in good standing now contains the names of 8,050 practicing dentists. These members are scattered geographically. A glance at the list would seem to reveal the fact that almost every town and city in the United States has one or more representatives in the association. With the one exception of the reorganized National Dental Association, the Dental Protective Association of the United States is the largest dental organization in the world; and the best feature of all is that the total assets, as reported by the treasurer at the last annual meeting, amounts to $35,508.37. Of this amount $26,000 is invested in approved municipal bonds; $6,000 is in individual notes secured by a corporation note for three times the amount; and the balance is in ready cash in a checking and savings account in the Northern Trust Company of Chicago.

READY AND PREPARED TO DEFEND ITS MEMBERS.

Thus it will be seen that the Dental Protective Association of the United States is a live, healthy organization, standing ready, as it has always done in the past, to defend its members against the unjust demands of patentees whose claims are worthless.

THE ASSOCIATION'S AGREEMENT WITH DOCTOR W. H. TAGGART.

This brings us to a discussion of the status of our members with reference to the Taggart litigation. On December 5, 1910, the board of directors of the Dental Protective Association of the United States, recognizing the value of the Taggart Method of Casting, after much discussion and many conferences, entered into an agreement with Doctor W. H. Taggart, a member of the association in good standing and the sole owner of certain patents on this new and original method of making dental inlays and the like, by the terms of which members of the association could obtain the permission to practice the Taggart Method of Casting for the life-time of the patents (seventeen years) with any machine he may then be using for the cash sum of $15. This agreement also provided that any member of the profession who joined the association within the time specified could procure such permission on the same terms. The time limit of this agreement expired, except for recent graduates, on February 9, 1913.

STATUS OF RECENT GRADUATES.

A clause in the agreement provided as follows: "That those who entered the profession within one year from the date of the first court decision sustaining the validity of patents heretofore mentioned shall pay $15 for the permission to practice the Taggart Method of Casting; those that enter the profession from year to year thereafter shall have the fee reduced by as many dollars as the number of years elapsed since the first court decision sustaining the validity of said patents. One year from the date of graduating or entrance into the profession, in all cases, shall be given in which to pay the stipulated fee." The phrase "entrance into the profession" has been interpreted by the attorney for the association as meaning that an individual enters the profession when he takes the state board examination, receives his license to practice and has it recorded, whether he actually begins practice at the time or not. This explanation is here given for the benefit of the many recent graduates who are desirous of information regarding their standing under the terms of the association's agreement with Doctor Taggart.

OWNERSHIP OF A TAGGART MACHINE CARRIES WITH IT THE PERMISSION TO USE THE METHOD.

During the time from December 5, 1910, to February 9, 1913, when the terms of the agreement were open to not only our members, but to the entire profession, there were over 4,200 practicing dentists who availed themselves of the terms and paid the $15. At this time Doctor Taggart was offering his *casting machine* for sale. This could be purchased through the association for $75 cash, or direct for $100 cash. A great many of our members purchased the machine direct from Doctor Taggart before the agreement was made; a few subsequently purchased it through the association. A considerable number of dentists who were not members of the association also purchased the machine direct. The right to use the Taggart Method of Casting went with the purchase of a machine from whatever source; and the ownership of a machine today carries with it the permission to use the Method. This information is given and emphasized here for the benefit of those dentists who own a Taggart Casting Machine. Those of our members who purchased the machine must remember that whoever owns the machine today, no matter where or how it was purchased, holds the sole right to use the Method. In other words, a machine cannot be sold to another and the former owner retain the privilege of using the Method.

STATUS OF MEMBERS IN TAGGART LITIGATION.

This question is frequently asked: Where does the individual stand, with reference to the pending Taggart litigation, who is a member of this association in good standing and who did not accept the terms of the agreement with Doctor Taggart before the time limit expired? In reply to this important question, we will say that every member was notified individually and through the dental journals, not only once but several times, of the opportunity afforded by the terms of the agreement; and those who did not accept *forfeited their right to protection from this source by this association.* They are hereby so notified that they may either settle direct with Doctor Taggart or make whatever other arrangements they see fit to protect themselves from the Taggart patents.

The question has also been raised as to the right of a member of this association, who did accept the terms of the agreement with Doctor Taggart, to join other associations organized primarily to fight Doctor Taggart. Every member of the Dental Protective Association of the United States who accepted the $15.00 proposition, agreed by signing the by-laws, to abide by the same. Under Section XIII of said by-laws, the third paragraph reads as follows: "If said $15.00 be paid before the entry of any decree or judgment finding any of Doctor Taggart's patents mentioned above in said agreement valid or granting damages for infringement thereof, the member is free to practice the method with any machine he may then be using, and after the date of said decree or judgment, the member is not to purchase or use machines infringing Doctor Taggart's machine patents, except as aforesaid, and *no member of the association is to defend or join in or contribute to the defense of any suit upon any of said patents while practicing the method under such permission from Doctor Taggart."* In this connection it may be stated that this agreement with Doctor Taggart was no voluntary effort on his part; and after he finally consented to what he felt was practically giving the method away ($15.00 for 17 years amounts to about 88 cents a year) he demanded this clause on the contention that he would not grant a man the right to use the method for practically nothing and leave him free to contribute several times the amount, if he so desired, to defeat him in court of his just due. The Board of Directors recognized the justice of this demand and consented to it. Thus this question is answered here in full.

MAY DENTISTS NOW JOIN THIS ASSOCIATION?

It is frequently asked if the doors of the Dental Protective Association of the United States are now closed to the profession, or if members of the profssion may join at this time. In reply to this question we will say that, subject to the approval of the Board of Directors, any member of the dental profession may become a member of the association on payment to the treasurer of a membership fee of $10.00, and subscribing to the by-laws of the association; but it must be with the distinct understanding that the time limit of the agreement with Doctor Taggart has expired, except, as previously mentioned, for recent graduates or those who have not been in the practice of dentistry for more than one year.

WHY DENTISTS ARE JOINING AT THIS TIME.

Though no immunity can be offered by this association at this time from Doctor Taggart, except to recent graduates; nevertheless, dentists are joining the association for the protection afforded them from other sources. There has scarcely been a time since 1888, when the Dental Protective Association of the United States was first organized, when the association has not had pending more or less patent litigation. It has been successful in all of its suits to date. There must be a reason for this. We believe it is due to the fact that the association was organized on the right basis; for the sole purpose of defending its members against abuse by patentees whose claims were worthless, and not to defraud any man of his just due. The United States Government, through its patent office, grants patents to individuals whom it believes have something worthy, new and original. In this manner it encourages inventive genius. It would be wrong for any association to attempt to fight all patents, dental or otherwise, regardless of their merit. Such is not the policy of the Dental Protective Association of the United States; but let it be remembered, *that it stands today, as it has stood for nearly twenty-eight years, like a stone wall between its members and patent abuse.*

At the present time the association is defending one of its members who has been sued for infringing a patent on a set of instruments for scaling teeth. In the opinion of the Board of Directors the principle involved in the patent, and on which it is based, is neither new nor original; and they felt that it would be dangerous for the members and the profession to have said patent validated in court. Therefore, they have directed the attorney to assume full defense of the suit on behalf of the association.

In this brief article we have endeavored to cover and explain, so far as possible, all points which may arise, now that the Taggart and other litigation is pending, in order to thoroughly inform the membership of the association, and incidentally others in the profession who may be interested; and to avoid unnecessary correspondence. However, should anyone want further information or desire to join the association, they may address the Secretary, 39 South State Street, Chicago, Illinois.

By order of the Board of Directors.

J. G. Reid, President.
J. P. Buckley, Vice-President and Secretary.
D. M. Gallie, Treasurer.

Chicago, January 3, 1916.

ARKANSAS STATE DENTAL ASSOCIATION.

The Arkansas State Dental Association will hold its annual meeting at the Hotel Marion in Little Rock, Arkansas, March 28, 29 and 30, 1916. We have arranged to have some special lectures by Dr. T. P. Hinman, Pres. Nat'l Dental Ass'n, of Atlanta, Ga.; Dr. M. L. Rhein, of New York, and Dr. C. N. Johnson of Chicago. In addition to these lectures, we will have the largest number of instructive clinics ever demonstrated at our meeting. Every ethical dentist in the state is cordially invited to be present at this meeting and affiliate with us. Wm. B. Dormon, Sec'y-Treas., Nashville, Arkansas.

ALUMNI ASSOCIATION—DENTAL DEPARTMENT, UNIVERSITY OF BUFFALO.

The annual alumni meeting of the dental department, University of Buffalo, will be held at the Iroquois hotel on Friday and Saturday, February 18 and 19, 1916. We shall have with us this year Dr. Elmer S. Best of Minneapolis, who will bring an interesting essay and clinic on "New Methods of Root Canal Treatment," also Dr. Alfred S. Walker of New York City, who will clinic both days of the meeting on the following subjects, viz.: (a) Ionic Medication in Dentistry; (b) The Faradic Coil as an aid in determining the vitality of the Pulp. In addition to the above named clinicians we have several more from a distance and a good array of local talent. All of the exhibit space is taken so you can be assured that the meeting will be up to the standard in this respect. Don't forget that on Friday evening we shall have our usual dinner and a good social time. Business Committee—G. E. Jackson, J. L. Cleveland, T. A. Hicks.

RESOLUTIONS PASSED ON THE DEATH OF DR. G. V. BLACK.

The members of the Northern Illinois Dental Society desire to express their feeling of personal grief and loss in the death of Dr. G. V. Black, and we desire hereby to pay tribute to his greatness, efficiency and loving, helpful sympathy, which has been an inspiration to each and every one of us.

His greatness and usefulness, recognized by dentists all over the world, were most fully understood and appreciated by those who knew him best. His studies, researches, inventions, most of all his teachings and writings, have greatly enriched our resources of knowledge and skill to the benefit of ourselves and our patients.

His fame is world wide, but we of the Northern Illinois society desire to express the closer and more personal feelings of admiration and affection it has been our privilege to develop by reason of frequent and delightful association with him. His earthly work is finished, but his beneficent influence upon the dental profession will last as long as the memory of the profession lasts and its literature is preserved.

Dr. Edmund Noyes, Chicago.
M. L. Hanaford, Rockford.
M. R. Harned, Rockford.

PATENTS OF INTEREST TO DENTISTS.

1113090. Sanitary dental impression tray, R. C. Bell, Mount Carmel, Ill.
1112697. Artificial teeth, Friedrich Heyde, Tegel, near Berlin, Germany.
1112561. Tooth brush, Edwin H. Rodell, Cumings, N. D.
1112847. Centered mold for dental castings, Heinrich Schweitzer, New York, N. Y.
46510. Design, sanitary tooth cleaner, Edwin G. Over, Fort Worth, Tex.
1113752. Dental handpiece, Alexander Campbell, Los Angeles, Cal.
1113325. Implement for forming metal backs for artificial teeth. Ernest D. R. Garden, Los Angeles, Cal.
1114624. Tooth straightening appliance. A. G. Meier, St. Louis, Mo.
1114646. Tooth brush, Lajos Pap, Arad, Austria-Hungary.
1114291. Orthodontic appliance, Ray D. Robinson, Los Angeles, Cal.
1115061. Tooth brush holder, John B. Foster, Newark, N. J.
1115779. Dental flask and means for closing and fastening the parts thereof, George Brunton, Leeds, England.
1116056. Apparatus for fumigating dental cavities, Henri Grasset, Paris, France.
1115678. Dental casting apparatus, W. B. C. Kaiser, Hamburg, Germany.
1116310. Sanitary dental tray, N. A. Maser, Vineland, N. J.
1115718. Dental instrument, Wm. H. Mosley, Toronto, Ont., Canada.
1116868. Saliva ejector, A. A. Anzelewitz, New York, N. Y.
1116371. Artificial denture, Ernest C. Bennett, New York, N. Y.
1116497. Tooth bridge, Friedrich Schreiber, Berlin, Germany.
1117660. Dental apparatus, John M. Gilmore, Chicago, Ill.
1117701. Dental syringe, F. L. Platt, G. N. Hein and R. R. Impey, San Francisco, Cal.
1117275. Dental impression tray, S. G. Supplee, East Orange, N. J.
1117276. Taking partial impressions for artificial dentures, S. G. Supplee, East Orange, N. J.
1117277. Heating apparatus, S. G. Supplee, East Orange, N. J.
1117928. Attachment for dental impression cups, W. J. Thurmond, Columbus, Ga.
46650. Design, tooth brush, Jay Lavenson, Philadelphia, Pa.
1118183. Blowpipe apparatus, W. C. Buckham, Jersey City, N. J.
1118301. Filling teeth, Thomas B. Magill, Kansas City, Mo.
1118156. Making a tooth brush, Joseph Schoepe, New York, N. Y.
1118703. Dental bridgework, George W. Todd, Omaha, Neb.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solictor of Patents, Fendall Building, Washington, D. C.

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WHAT IS THE MATTER WITH DENTISTRY IN ST. LOUIS?*

BY CLARENCE O. SIMPSON, M. D., D. D. S., ST. LOUIS, MO.

In the discussion of this subject there is no intention to maliciously criticise or to gratify personal grievances, but rather to crystallize, present and analyze some complaints of the factors which seem to be impeding the progress of dentistry in this city, hoping benefit may be derived from the vivisection. The essayist claims no superiority, freely admits his deficiencies, and the only motive is to assist in making the practice of dentistry in St. Louis more attractive, efficient and remunerative.

Believing a straight line is the shortest distance to any point and a deep incision is required to remove a malignant growth, facts are stated plainly without evasion or palliation. Conditions and procedures, not individuals, are considered, and while certain characters may be suggested to you by the text, perhaps the other fellows are thinking of you. Many of the accusations apply to dentistry everywhere, but more forcibly here, where we are familiar with conditions and interested in correcting the evils. It is believed half of this audience will admit the truth of the arraignment, and for the other half—the hind quarters—they are the butt of the remarks.

The paper is designed only as a preliminary outline of the indictment, the battery of specially engaged and prepared talent who will discuss the paper are expected to furnish the evidence upon which to base your conclusions. Through conservatism, local pride, or personal interests which are not conducive to the general welfare of the profession, some of them may disagree with the fundamental idea and many details of the paper.

To logically ask what is the matter with dentistry in St. Louis, proof should be presented that something *is* the matter. In the earlier history of dentistry St. Louis claimed men such as Black, McKellops, Judd, Forbes, Eames, Spalding, Keith, and Park, men of wide reputation whose names are prominent in the pioneer days of the profession. How many names would a real honest-to-goodness "who's who" in dentistry give St. Louis today? We have men whose ability, ideals and operations are rarely excelled; but they are so modest, lazy, or overworked that they exist in selfish obscurity. They do not clinic, write, or attend society meetings, and are doing nothing for the advancement of dentistry except in the limited sphere of their practice. The proper application of their talent and influence would improve local conditions, and their reticence is a greater detriment than the misdeeds of those less capable. This policy long retarded the development of dentistry, and were it not for the many notable exceptions who have labored unselfishly, it would be fifty years behind its present state. Another class, many of whom deserve a "call," is our imposing array of ex-presidents, who after having been honored by the society retire to the seclusion of the Altenheim. After soliciting members, cajoling their committees, "salving" their secretary, and having a "glad hand" for everyone to promote the success of their administration, at the time when their experience would be most valuable, they disappear from the haunts of men as completely as Charlie Ross or a defeated candidate on the prohibition ticket.

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*Read before the St. Louis Dental Society, October 12, 1915.

A list of authorities on dental subjects, or even contributors to the current literature, shows lamentably few local contemporaries. At the last four meetings of the National Dental Association and the fiftieth anniversary of the Illinois State Dental Society, which were the most important meetings during this period, 191 Chicago men have been on the programs as clinicians, not including 240 in the progressive clinic at the anniversary meeting, most of whom were from Chicago, which would bring the total to 431. New York, more than 800 miles from all these meetings, except one, has supplied 75; Cleveland, 58; New Orleans, over a thousand miles away, has given 11; Atlanta, almost as far, 21; while the following cities, having no advantage in location and not ranking in importance with St. Louis: Kansas City, 34; Milwaukee, 28; Buffalo, 24; Detroit, 22; offer an unfavorable contrast to the 42 from a city of the size and geographical position of St. Louis.

In regard to essayists and discussers on the literary programs the comparison is less gratifying: Chicago, 60; New York, 40; Philadelphia, 30; Kansas City, 23; San Francsico, 22; Cleveland, 21; Boston, 17; Atlanta, 16; Cincinnati, 15; Detroit, 10; and down the list until St. Louis, with but seven, is reached. This must be some indication of the demand for, and the participation in the important meetings of the country by, St. Louis dentists; since no better manifestation of interest and co-operation in the development of the profession can be determined than the active participation in society meetings.

In the investigation of society work the following statistics compiled from correspondence with the respective secretaries show the record of this society in comparison with that of other cities:

.Society and City	Dentists in City	Members in Society	Average Attendance.	Other Societies
Chicago Dental Society, Chicago	2,000	1,350	400	Five branches with average attendance of 75. Several study clubs.
First Dist. Dental Society, New York	1,800	750	250	Allied council, 350 members. Bronx County, 70 members.
Academy of Stomatology, Philadelphia	1,500	200	100	Four other societies.
Second Dist. Dental Society, Brooklyn	700	295	125	Kings County Society, 250 members. Last year had study clubs of 25 each in bacteriology, root canal work, and pyorrhea.
First Dist. Dental Society, Detroit	525	320	85	No record of other societies.
Odontological Society, Pittsburgh	500	350	125	Pittsburgh Dental Club, 75 members. Post-Graduate Study Club, 125 members.
San Francisco Dist. Society, San Francisco	500	225	75	One other society of 50 members.
Cleveland Dental Society, Cleveland	465	241	150	Fraternity Study Club, 30 members. Round Table Study Club, 15 members.
Cincinnati Dental Society, Cincinnati	375	160	55	Another society 25 members.
Milwaukee Dental Society, Milwaukee	300	130	50	Three other societies of 20 to 30 each.

Kansas City Dental Society, Kansas City	275	145	50	Two study clubs of 20 each.
Kings County Dental Society, Seattle	250	130	40	Seattle Dental Study Club, 13 members. Washington Dental Study Club, 12 members. Puget Sound Dental Study Club, 12 members.
Denver Dental Association, Denver	225	116	45	Farrell Study Club, 25 members.
Rochester Dental Society, Rochester	150	75	35	Study Club, 15 members.

The meetings of this society and the Missouri State Association too rarely produce essayists from their own membership. To arouse interest it has been considered essential to obtain outside talent, and when local men have been on the program they have not been accorded the deserved attention or deference. This arises partly from the fact that the men may not have the prestige from original work or have not given sufficient study to the subject to demand respect, but more from the attitude of the members who are prone to depreciate such efforts and either do not attend, or listen with a spirit of criticism and ridicule. This not only minimizes the effectiveness, but discourages subsequent attempts.

A marked contrast is offered by some city and state societies whose policy of developing material within their society makes it unnecessary for them to seek elsewhere for talent. The basis of this plan is encouragement, co-operation and appreciation of their fellow-members by inviting them to contribute to the program, and these men, esteeming the expression of confidence in them, freely expend the time and labor required to prepare something worth while. When the matter is presented it is usually praise-worthy, but whether it is or not, it receives the highest commendation, both loud and long. The result is stimulation to additional and greater achievements for the individual, an autoinduced elation and satisfaction to the members of the society and the general spreading of an impression, that these men are doing big things, and these societies are extremely fortunate in having such men; while other societies afflicted with hypermetropia such as ours are trying to secure the services of some of these artificially grown luminaries to enhance their meetings.

A personal acquaintance during the past fifteen years with some of the present crop of scintillating dignitaries whose names are a fetish in dental circles impels the conclusion that they attained their "perch on the peg" by lifting on their boot straps, while the real source of energy was a vigorous pull on the trouser-seat by the "home guard." This criticism does not apply to the many men who through exceptional ability and diligence merit the reputation they have gained, but is mentioned as an example of what persistent "boosting" and "bazoo blowing" can do. A marked contrast is the scheme of action in this city, where it is necessary for men to go away from home to find appreciation, and if there should be an echo of applause return it is promptly muffled. A favorite "wheeze" of some St. Louis dentists when visiting other cities, upon receiving the inquiry, "How is my friend, Dr. Wind, in St. Louis?" is to reply, "I don't know the gentleman; never heard of him." Decidedly clever, but never known to procure you anything here or hereafter.

The advancement in dental practice in the past few years has been remarkable because more varied, earnest, scientific investigation is being directed to dental problems than ever before. In the past, a few men with the true scientific trend have labored and perfected much which has been assimilated into recognized practice, but now from all quarters new theories are being exploited, new methods proposed, and new products offered.

We have had the introduction and development of the casting process, the most revolutionary innovation in the history of dentistry, the results of ingenuity, experimentation, and study of men whom we are content to crudely imitate. We have the opportunity to utilize and add to this knowledge, yet the prevailing practice in St. Louis is the use of home-grown casting machines with dependence in Divine Providence and Snow Boy copper cement, which sterilizes while you eat. We have a new era in pyorrhea treatment with the problems presented in the use of vaccines and the alleged specifics to eradicate the scourge, yet what has St. Louis contributed, except for ammunition?

We have reached the millennium of painless dentistry, under which shell is the little pea, analgesia, zonatherapy, or conductive anesthesia? In these St. Louis ranks with the "rankest," having received "stable information" that this was a practice builder, that there was some easy money waiting to be spent in this game. Preceded by impressive advance notices, a Nitrous Oxid Wizard came to lead us, Moseslike, into the promised land of prosperity and twilight sleep. The picture was too alluring to resist, so we sat at the master's feet to learn the technic of analgesia, hypnotism and salesmanship. A year later when analgesia had served its purpose for ethical advertising, and like Goldberg, we asked, "What are you going to do with it?" with a presumption rivaling that of J. Rufus Wallingford, a return engagement in conductive anesthesia was played to capacity. There still remains a course in zonatherapy on which to get a toe hold for those who are not "gun shy."

Radiography has done more to show up "short order dentistry" than all the cotton root-canal fillings held before the victim's eye or old bridges held under their nose, yet with all the barber shop operating rooms and sporting house reception rooms, no radiograph equipment has been installed by St. Louis dentists. Preferring to let sleeping dogs lie so long as they do not lie about us, and with the excuse of "what you don't know won't produce insomnia," we continue to practice "by ear." When complications arise which bring to our patients visions of flowers they will never smell and the "pussy-footed" funeral director, we send them out to the professional "flimmer" much as the South Side bride wends her way in an open hack to the photographer.

Prophylaxis or preventive dentistry with the misleading slogan of "a clean tooth never decays" seems the ultimate "why not now?" There is hardly another city in the country which has not its corps of "white wings" who are helping to keep the city clean where it needs it the most. In St. Louis we are still "plugging" them, "capping" them, and giving them the "once over" at watch-cleaning rates. A young man who maintained an office for two years recently closed it for more profitable employment, with the explanation that it required money to practice dentistry, and he was going to make enough to practice another year. Certainly displaying a commendable love for his profession and confidence in his own ability.

If anyone was sufficiently optimistic, how much capital would be necessary to specialize in prophylaxis in St. Louis, depending upon the profession for support? But if one had the money, why become as popular as a skunk at a lawn party—open a bank instead. Imagine the primrose path in prophylactic or pyorrhea work, visualize the collection of junk, the ill-fitting crowns, the "self-collecting" bridges, the "hangover" fillings and the "meat holes" which would appear to thwart one in the herculean task. The situation calls for diplomacy and magnanimity, treatment cannot conscientiously be instituted under the adverse conditions, nor can the patient be referred back to the dentist with instructions to remove the restorations, which have recently been placed with great pride and eclat.

In prosthesis, one of the most neglected and despised branches of practice, our record is no better. The improved methods of taking impressions and the anatomical arrangement of teeth have been taught and demonstrated, but seemingly passed overhead in St. Louis. The mail order laboratories, with their ridiculous price lists, which produce 95 per cent of our artificial dentures, and will construct a fourteen-tooth bridge from a finger print or an artificial leg from a photograph, report their tranquillity undisturbed by the advent of a face bow.

We now have dental amalgam manipulation standardized with possibilities in amalgam restorations never before attained, within reach of all who care to acquire and conform to the technic, yet a periscopic reconnoitre shows an unrippled surface of amalgam obsolescence. The local union, of the Amalgamated Brotherhood of Ball Burnishers, is true to the principles of the adjacent anatomical structures for matrices and cotton pellet finishing. As for the reproduction of typical occlusal form in restorations, it is so rare that on one occasion when it was attempted the patient returned to have it repaired, saying she thought Dr. Slocum's inlays were much better because they felt "more slickery" to her tongue.

So we could continue "ad nauseam" on the lack of progress and deficiencies in dentistry. The collosal egotism and self-deception which permits the majority to dispense their services to the trusting public year after year without the assimilation of a new idea or the adoption of an improved method would be ludicrous were not its effect so extensive and pernicious.

The perfecting of efficiency in industrial lines has been developed by specialization, by having a man or a group of men to make a part or perform a step toward the formation of the finished product, which has resulted in increasing the output, perfecting the detail, and improving the skill of the workmen. While the practice of dentistry is not analogous to the manufacture of an automobile or the operation of a railroad, in the study of efficiency we may advantageously apply some of the methods which have reached the highest degree of development in these pursuits. The progress in medicine has resulted from specialization, limiting study and practice to certain branches; surely the practice of dentistry is too complex to secure the best results by individual efforts in general practice. The varied character of the operations demand versatility rarely found in one man even though all branches were equally attractive to him, which is unusual, and proficiency was attempted in each.

In the development of specialization the dental profession has been notably slow, the men who first attempted to limit their practice to a particular branch encountered much opposition and have never received the support of which they are deserving. Patients are often discouraged from consulting a specialist and dentists too often accept the exaggerated reports of alleged atrocities at the hands of specialists, which include everything but mayhem and arson, and express disapproval without knowledge of the facts.

Negligence, incompetent diagnosis and advice concerning orthodontic treatment, is so prevalent that the orthodontists are handicapped by the profession at large, with whom they are working in a common cause and from whom they naturally expect active cooperation. No effort is required to ascertain the accuracy of this statement; evidence of it is obvious. In families, financially able and desirous of proper care, children with incipient and even advanced cases of malocclusion make periodic visits to the family dentist without attention being called to abnormal conditions. The family dentist even when questioned too often evades it with the statement that it will probably correct itself, proposes to put on a "brace" to pull the tooth in, or sometimes the forceps to pull the tooth out, and depreciates the value of expert consultation with "Oh, a specialist would charge you a thousand dollars for that work." Perhaps he would, and the service would be worth it from any viewpoint, but the cold-bloooded statement without the honest, intelligent explanation which should accompany it, is calculated to prevent further interference with his omniscient sway. It might be interesting but deplorable to know what proportion of orthodontic cases come to the specialist through the influence of the family dentist as compared to those originating from the observation, interest, and inquiry of the laity.

The crown of thorns, which has been the distinguishing characteristic of the exodontist, when examined discloses similar despicable motives and acts. They have begun a limited practice to a serenade of "cat-calls," accused of being a failure in general practice, and ridiculed for their presumption. Instead of being welcomed and encouraged in their commendable endeavor to relieve general practice of this undesirable and unremunerative feature, they have been ignored by many, sent the cases which had baffled the repeated attempts of others, and thankfully received by a few. Even now, after the specialty is well established, more by the appreciation, advertising, and demands of the public than by the profession, there remains much ill-concealed opposition and disloyalty.

After successful results in extremely difficult and hazardous operations their fees are questioned, not confidentially but publicly, sometimes to the extent of encouraging patients to repudiate them. If complications which are often unavoidable arise, the general practitioner too often develops a sympathetic and critical pose which has never been a part of his repertoire in his own treatment of patients, and sometimes is the instigator of serious trouble. Capital punishment should be prescribed in the code of ethics for men who fail to protect the reputation of a specialist to whom they have referred a patient, since some men are amenable to no higher standards of professional conduct than the letter of the law.

The indifferent support given specialists has been justified by complaints of no gain in service and larger fees than the general practitioner has ever obtained, of the arrogant and businesslike methods of specialists, and their lack of cordiality and deference to patients. A fine line of conversation for a profession which has accomplished so little in impressing the laity with the importance and value of its services. The average patient is greatly in need of discipline, and since it is evident the invertebrate dentist does not cultivate a dignified demeanor becoming his station, but grovels in the dust at the dictation of his clientele, let us preserve a discreet silence while others do for us what we should have done long ago. A tactful air of courtesy, affability and gentleness towards patients should never degenerate into the servility of a negro waiter, the haggling of a huckster or the familiarity of back-fence gossip. The public will never regard our time valuable while we permit it to be wasted in "coffee klatsching," nor can we ever command respect while we apologize for and explain each procedure, and escort our patients to the elevator or street.

There has been too much shopping and too many family histories narrated by patients and too much time spent by dentists listing their wealthy patients, relating their miraculous achievements, and exploiting some new method or appliance which the patient is led to believe original and exclusively used. According to authentic reports the cast inlay was invented by numerous local men, nitrous oxid analgesia was featured by others as a personal triumph, silicates were represented as "something new I am using" as recently as this month, emetin treatment has been used almost as much for self-exaltation as pyorrhea, and desensitizing paste (literature and removable labels notwithstanding) was compounded by several local Munchausens who cannot make a good mix of cement.

A monologue by a professional man on the character and quantity of his clientele or how much money he is making, to intelligent people is suggestive of "Abe and Mawruss' in the cloak and suit business or a small boy boasting of his Dad. A dictograph exchange with connections to the operating rooms of some very dignified and ethics-prating dentists would supply enough material to put on a night shift of the St. Louis Dental Society's committee on ethics and "ejection."

The majority of us are too narrow between the eyes to get a focus on the trend of the times, too engrossed in each of the many diversified operations attempted to get a perspective of the entire denture and the contiguous soft tissues. We are neither serving the public to the best advantage nor working to our own best interests in trying to "spread eagle" the field, having in no phase of practice attained the proficiency demonstrated by men concentrating their efforts to a limited field. We are loath to admit anyone knows more about any branch of dentistry or can perform any dental operation better than we. We are opposed to letting a restless dollar get out of our offices, and advocates of the sentiment, "a bird in the hand gathers no moss," when it probably would increase our income and enhance our reputation to advise expert consultation for many of the cases we now treat. Satisfied at being able to attract a crowd, we are blocking traffic with our imitation of a "one-man band," trying to play all the instruments at once and make enough noise to discourage any solos, but only succeeding in making ourselves ridiculous to those who recognize good music.

While it is the belief of the essayist, that the average character of dental operations performed in this city is inferior to that of other similar communities, it is impossible to substantiate it by evidence, in the absence of which, discussion would be a matter of personal opinion, and futile. However, the statement that the average character of dental operations performed anywhere is so far below the existing standards of practice that it is a disgrace to the profession, a betrayal of public confidence, and likely to provoke the wrath of God, is made after due deliberation and with proper regard for the gravity of the charge. The examination of ten or a hundred people chosen at random will convince anyone who is familiar with the possibilities of modern dentistry, or who for comparison cares to apply the requirements as stated in late text books by authorities on the various subjects.

We are constantly advised to extend leniency for mitigating circumstances that judgment be tempered with mercy until a doubt may well arise as to whether the merciful justice is not being imposed upon through a feeling of security from exposure. Such fervid appeals have been made for mutual protection and unqualified immunity that it has suggested the preparation of a soft spot for the landing of some one who was riding a reputation with gutta-percha inlays and cement tuck pointing. There is no chance of mistaking the imperfection of operations conscientiously attempted for the careless, dishonest, "easiest way to get by" methods practiced by those deserving little charity. The time-honored excuses of incorrigible patients and inability to give better service for the fee received, are possible to correct. The real reasons of not being capable of better operations and having no desire to improve is the vulnerable side where criticism should not be withheld nor censure spared. On this score St. Louis dentists are criminally negligent; opportunities for gaining knowledge and skill being ignored, ridiculed, and assailed.

Papers of immense practical value have been read before this society to an audience, the size of which would discourage a street faker, or a dog fight, and not composed of the men who were most in need of instruction. The attendance at meetings is but one phase of our indifference, the study of text-books and the improvement of technic offers even a wider field for development; yet little individual effort has been manifested in St. Louis and no organized groups are striving for the benefits which are being derived from the study, technic and research clubs in other cities.

The only subject which arouses general interest is that of fees or something which seems promising in immediate financial gain. The record meeting of this society in point of numbers was the disappointed gathering of mysterious strangers who were attracted from their evening hours for a radius of a hundred miles to hear the recent paper by one of the original exploiters of the emetin treatment. They were disappointed on hearing a conservative scientific review of the subject when they had anticipated inside information on a quick and easy way to commercialize the treatment of pyorrhea. Dissatisfaction at the low fees is general and a spirit of unrest is evident from the interest manifested, but what of the methods employed to increase them? A principle of successful commercial advertising is not only attracting attention and making sales, but that the product must have a sound economic value by which the advantage is maintained and the cost of advertising made a profitable investment by a permanent increase in business.

It is a difficult problem to materially increase fees unless the service is correspondingly improved. A few men have acquired a lucrative practice under favorable circumstances or through exceptional business ability in conducting a "dispensary," but generally the large fees have been obtained for superior services. In trying to establish a standard of fees by calculation of investment and cost of production, the incentive for self-development is eliminated and professional service lowered to the plane of a mercantile transaction, in which cost, overhead expense, and a margin of profit determines the selling price. This is but a small part of the value of dental operations, since it does not consider the vital factors of efficiency and skill, upon which the quality of the service and its benefits to the patient depends. This is an objectionable feature of trade unions with a fixed wage scale, which discourages ambition and obliterates individuality, reducing the superior workman to the level of the incompetent. While it is true dental fees in general are too low, the more intelligent and commendable course of increasing them by acquiring more knowledge and skill, performing better operations and making the service worth more, should be advised.

Dental fees are not regulated by an Interstate Commerce Commission, but have been established by, and are under the absolute control of the profession, who by concerted action could change them at will. This recalls the characteristic lack of co-operation among dentists in the antagonism displayed toward the men who receive large fees. These men are vilified at every opportunity by those less successful, who, unable to perceive that every hundred-dollar fee makes the ten-dollar fee easier, tell patients they are overcharged when there is nothing to gain and an inevitable loss. The valuation placed on a satisfactory service by the producer influences the estimation of that service by the public, and when the despicable detractor "horns in" with disparaging remarks, intended to promote selfish interests and destroy confidence in others, his "pin-head" policy acts as a boomerang. To discerning people it suggests his inability to duplicate the operation or appreciate its superiority, and exposes his "dollar down and a dollar per week" standing. Like other prevalent evils, this is hard to eradicate, since those addicted to it are of a mental caliber which cannot comprehend its folly and inconsistency. The compensating feature, however, is, the successful man is enhanced by the procedure while the envious failure has only increased his difficulties.

Any philanthropically inclined individuals having the laudable desire to supply low-priced dentistry to the indigent should be encouraged, but to people who maintain automobiles, patronize the florist and the caterer, the dentist who "pulls" the bargain counter stuff is being played for an "easy mark." Money doesn't care who has it, and there is no great affinity between wealth and brains. There are many wealthy families so deficient in refinement, culture, and "class," that the use of the tooth brush has been discovered simultaneously with the shaking off of the Saturday night bath habit; families who have fallen into a wine income but still retain the "growler" taste. They deface a harmless street with a residence combining all recognizable styles of architecture with cubist touches, and resembling a hybrid of an eleemosynary institution and a Polish church. The feminine representatives "doll up" like animated Christmas trees, affect a "gasoline solarium," put on a few Bradley-Martin balls, and subscribe for a box at the opera; but still believe having teeth cleaned removes the enamel, and attach the same relative importance to having a tooth "fixed" as removing an obstruction from the toilet trap. So they find the cheapest "tooth plumber" in the neighborhood who puts on another "washer" or "wipes a joint," at "scab" prices. These people, with a plebeian love for display, lavish money on the crude extravagances and frivolities; but through ignorance are satisfied with the poorest dental attention and its effect upon their physical welfare. They would feel disgraced without modish and expensive wearing apparel; while the care given their teeth, which contributes far more to their appearance, places them on a level with those who are dependent upon clinics and can afford nothing in the way of dental repair but the cheapest of necessities.

Our greed and petty jealousies have done more to keep the profession from its just deserts than all other influences combined. There is a pack of "four-flushing" confidence workers who have "boobed" the dentists in this town for years; preying upon our cupidity and fear to exact businesslike terms, these prosperous appearing male "crooks" and "baby-stare Janes" change their dentists as often as necessary to avoid payment, while we continue to welcome their coming and permit their departure without a warning to others.

If there were more business instinct and unselfish principle in this society we could maintain a credit bureau for the protection of the members, which would brand these "short sports" and "dead-beats." The retail merchants, as lenient as they are in extending credit, have found this compulsory. The department stores, by encouraging "payments on account," carrying a continuous balance, advertising "purchases will be charged on next month's bill," and physicians who can treat an entire neighborhood and prosper if they collect half, have corrupted the public sense of moral and financial obligation until prompt collection by the dentist is resented. They feel justified in discounting our bills, or paying small monthly installments with "King's ex" during the vacation and holiday periods and time out for good behavior or additions to the family.

Our limited capacity, the great expenditure of time, labor and material in production, and the restricted facilities for enforcing payment after the service is rendered, necessitates a stricter credit system in the future; we have the power to dictate terms and are largely to blame for existing abuses. If we were not so desirous to monopolize practice and get the other fellow's patients, fees would be higher, collections easier and our prestige greater.

If conditions in St. Louis are not what is expected of the fourth city of the country with the first dental college and the first dental society in the West, dental laws more stringent than the average, and a board of dental examiners which has practically eliminated the advertising faker, what is the explanation? St. Louis surely offers as good opportunities as other cities; its population is largely composed of middle class people in comfortable circumstances who are popularly supposed to make a desirable clientele. It is financially sound, not dependent on one or a few industries, little disturbed by national depressions, and its transient population is insignificant; in fact, it would seem to offer a favorable field in which to establish and conduct a model dental practice. People of this character should have adequate dental attention and pay commensurate fees, which would result in the highest standards of practice, and prosperity for the dentists. The local dental supply dealers know, but cannot diplomatically admit, what the manufacturers say without hesitation, that St. Louis is one of the poorest territories in the country for the sale of new appliances and expensive equipment. The select list of "slow pay" dentists on the books of the two supply houses which have been forced to close during the past few years indicates a woeful lack of either prosperity or honesty in the profession.

Instead of economic reasons, the explanation might be offered that insufficient education of the public along dental lines was responsible for conditions. It is true educational opportunities in the oral hygiene campaign, dental inspection in the public schools, and free dental infirmaries have not been utilized as in other cities, but how can the public be educated by uneducated dentists? It is improbable a member of the school board or city council would become very enthusiastic about public dental service from association with his dentist, who had little knowledge of what had been accomplished elsewhere, or could offer no argument for such needs. A school teacher cannot secure information for classroom instruction from a dentist who is unable to describe the correct manipulation of a tooth brush, and talks of "gooms" and "stomach" teeth. Parents and children, as they learn the truth, are not likely to acquire a high regard for our calling from one who tells them pyorrhea is caused by salivation, dental caries come from an "acid stomach," and grinds the occlusal surface and places a crown (?) on every molar attacked by proximal decay. No; about as favorable prospects exist for producing a hemorrhage from a turnip, as the promotion of public instruction by the average dentist.

If, as has been suggested, dentistry as commonly practiced is greatly inferior to the approved standard, there must be more direct causes than the economic or educational status of the community. The personnel of the profession would be logically considered as an important factor in establishing the relative proficiency, but personal observation and sentiment do not furnish an exact or impartial basis for judgment. If there is any deficiency in the technical qualifications and education of dentists, the college which prepared them must assume the responsibility. This brings the query, why should there be five dental schools in Missouri and fifty in the United States? Surely, the extensive craving for a career in dentistry, from either a humanitarian or a mercenary inducement, does not warrant their existence, and the inexorable law of supply and demand must apply to dental colleges. Not necessarily implying that the schools are improperly conducted or the teachers have not conscientiously endeavored to perform their duty, but a dental department cannot be profitably conducted without students and an oversupply of colleges results either in a shortage of students or an unnatural stimulation of the demand. Instead of being able to select and cull the "rah rah" material, instincts of preservation force the colleges to accept all those who can qualify on the lax and easily evaded entrance requirements. Graduation from high school is largely a matter of serving time, and does not determine the amount of education assimilated and far less the aptitude of the student for a vocation. The demand for students to supply the colleges has resulted in a mass of unprepared youth being drawn out of industrial lines, for which they were better suited, into the study of dentistry. A vast number of so-called dentists are not adapted to the character of the work and have not had the proper preliminary education; with this handicap no system of special training can make them proficient, and the commercialization of dental education has intensified the abuse.

The public is affected most by the lack of skill and scientific attainment in these "misfits," but the greatest detriment to the profession comes from their deficiencies in character, honor, and ideals. Axiomatically a silken purse cannot be created from a sow's auditory appendage, nor can a consummate professional gentleman be developed from a lad whose hereditary characteristics and early environment have preordained him for a chorus man, a porch climber or a hod carrier.

A dental department of a state university, the only dental school in the state, recently dropped thirty men from the freshman class at the end of the first semester. These men had qualified for entrance, yet were not suitable material for the training they sought, a fact which *could* be determined in three days, instead of three years. It is hardly an irrelevant coincidence that the proficiency of the dentists and the standard of dental practice in that state is equaled by few, but if a dean of a St. Louis school should so far betray its interests he would be promptly escorted to the Arsenal street "resort for deep thinkers."

Another objectionable tendency in the dental schools is the recruiting of their faculties from their own graduates, which limits progress and the interchange of theories. Inbreeding will as effectually demoralize a dental college as a kennel, and produce the same results in the progeny. The rivalry among the local colleges has formed cliques, with more alma mater than "all together" proclivities, but this prejudice is inconspicuous when compared to some of the vendettas which have flourished among us for years. In fact, the integrity and fidelity of the younger men has been questioned, when they demurred at taking the "bloody oath" of allegiance to the cause and "nursing the grouch" for another generation.

When these personal feuds, "small town" jealousies and selfish interests are fused into a synthetic sentiment of common welfare, local conditions will improve. If we will discard the overworked hammer and look upon the state seal of Kentucky, with its motto, "United we stand, divided we fall," our gall bladders will eventually resume their normal size. When we learn there is no competition in honest, competent dentistry, many of our perplexities, which are only delusions, will dissolve into thin air. When we begin consistent efforts to increase our knowledge and skill, our daily tasks will become less burdensome, and our failures will blossom into redounding successes. When we develop unusual proficiency in the department of our greatest aptitude and become sufficiently energized to "break into the big league," that elusive thing called reputation will come to some of us.

Then, and not until then, will St. Louis cease to be a "whistling post" or a "tank town" in dentistry, and become a Mecca for the pilgrimages of those seeking the miracuolous and demanding the utmost. Long before that time the problem of commensurate compensation will have adjusted itself, and St. Louis will have attained international recognition for the superiority of its achievements in dentistry and the prosperity and culture of its dentists.

PRESIDENT'S ADDRESS.*

BY E. A. ROYCE, D. D. S., CHICAGO, ILL.

The year just passed has been one of progress in our profession. The movement forward has been by leaps and bounds, and the results will have a great influence, not only upon the present status of dentistry, but in the remote future, dentistry will be made vastly better and more serviceable to humanity by the good work which has been done in the last twelve months. I will not try to review all that has been accomplished in the different departments and branches of dentistry, for each seems to have vied with the other in their efforts to lead in the production of new and valued thoughts, methods and processes; but we will give just a passing thought to the educational phase of this progress which includes the efforts of the press and magazines to educate the people to the necessity of having proper dental services for themselves and their children. The grade schools are helping the work along and reaching many by their school instruction, lectures, and illustrations, who do not read the magazines. The importance of this work is second only to the work being done by the dental and medical professions in perfecting the methods of diagnosis of those ills which have their origin in toxemia. The kindly feeling and harmony that is apparent between the two professions in this work surely must be very gratifying to the members of both professions.

The dedication of the Forsyth foundation and the announcement of the gift of a similar institution to Rochester, N. Y., by Mr. Eastman marks this year as the beginning of a new era in the conservation and upbuilding of the human race. Grand as these institutions will be, they are only larger examples of what is being done all around us by men who are glad and willing to do their share, even at large personal sacrifice in the work of caring for the teeth of those who are not financially able to pay the usual fees for such services.

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*Read before the Odontological Society of Chicago, November, 1915.

The dental schools have not been behind in this forward movement. You will remember that some years ago they announced that their course would be increased to four years, as the educators considered the time that had previously been devoted to the study of dentistry was too short to properly prepare the student to meet the demands that would be made upon him in practice. But it was found impossible to maintain the new arrangement because the profession and public did not appreciate the necessity for this higher professional standard. Now, with better understanding of the needs of the people and a deeper knowledge of the intimate relation between the mouth and the general health by the dental profession, as well as by our medical brothers, the demand has been made that our students shall have the advantage of a longer course of study, and our schools have again come to the front with the announcement that their course would be increased to four years.

The continued effort to perfect the organization of dental societies so that the members of the profession may derive the greatest benefit from them, is another symptom which shows us that the dental profession is really alive. The reorganization of the state societies has accomplished much good, but perhaps the most noteworthy inprovement has been in the National Dental Association, with its many departments, including original research, and its own Journal as a medium by which to convey the results of its many activities and investigations to all who cannot attend its meetings. In this way it has established a broad field of usefulness and made membership in it a necessity to all who would have the best and latest word in dentistry.

At the December meeting of the Odontological Society Dr. Reid read a paper on "Mystery of Pain and Its Deceptions in Diagnosis." This was a splendid paper with which to open the Odontological year. It gave us a new view of pain and its relation to its cause that needed to be stated and emphasized, and the assayist made clear the necessity for a broader and deeper ground work upon which to base our diagnosis that it may be more accurate. The cases cited were to the point. The discussion elicited by the paper showed that those present appreciated the importance of the subject.

At the January meeting we were particularly favored. The paper presented by the essayist, Dr. Hinkins, on the subject "Hydrolysis of Triacetylglucose by Enzymes," showed that he, with his colaborer S. F. Acre, was years ahead of the chemists in the investigation of the subject. I wish I were able to give a proper review of that paper for it is one that deserves more than passing attention. The original work done at the time this paper was written and read before the International Dental Congress at Paris in 1900, not only enlightened us upon the action of the enzymes but it also placed the names of Hinkins and Acre with other investigators who have shown the world the methods used by the human economy in the conversion of foods to the uses of our bodies. We also had with us guests that added much to the interest of the evening. Prof. Hanke gave us a most interesting and instructive lecture with a direct bearing upon the subject under consideration. The discussion by the other guests and members was exceedingly good and altogether the January meeting was one to be remembered.

At the February meeting Dr. Woolley took us into the region of Prosthesis, the subject of his paper being "The Voice in Its Relation to Artificial Teeth." This subject is one of the most important and yet perhaps the most neglected of any in Prosthesis and we are under obligations to Dr. Woolley for the efforts he has made to impress this important phase of Prosethodontia upon us. The discussion of this paper was most satisfactory, bringing out the best thought of the members who have made a particular study of the subject of speech, not only from the viewpoint of the prosthodontist but also from that of the orthodontist, the oral surgeon and the voice specialist. We, as a society, are to be congratulated that we have with us members who are able to give us the best thought on these different specialties.

Owing to the illness of several of our members and the absence from the city of others, it was thought best not to hold a meeting in March. Instead we all pulled for those who were ill that they might recover, which they did, so the Odontological of Chicago was itself again for the April meeting, at which time we had the pleasure of listening to a paper on "A Treatment of Pyorrhea Necrotic Tissues," by Dr. J. S. Bridges. The essayist had nothing particularly new to offer in regard to etiology, diagnosis or prognosis of pyorrhea, but gave some very sensible reasons why the remedies recommended, if administered as advised, should be very effective in their action. A limited use of the paste as prepared by Dr. Bridges has proven the advantages of its use in the reduction of inflammation and also the permanence of effect, compared with those drugs administered in liquid form. The discussion added much to the knowledge and value of the paper.

At the May meeting Dr. Brophy presented to us a paper upon the subject of "Cysts." All of the contributions from Dr. Brophy's pen are of a high order and there is always a full attendance when he is the essayist, but this paper seems to have been particularly fitting, both in matter and manner of presentation. The subject was handled in a masterly fashion but at the same time in such a simple and direct manner as to make it one of the most valued papers of the season. The case exhibited gave us a slight idea of the work the Doctor has done for this patient, but can we comprehend the great benefit he is doing to humanity, both by his own operations and by his teachings? The discussion of the paper voiced the views of each member upon the subject and each also expressed his appreciation of the paper.

A combination of circumstances prevented the usual June meeting. This surely was a misfortune for the day or two outing we have together each year serves to bind the ties of fellowship more firmly.

If we are to judge from the reports given at the October meeting the United States must have been pretty well covered, during the summer, by the traveling contingent of the Odontological. However, they all seemed glad to get back to old Chicago and once more gather around the mahogany for our monthly Odontological dinner. On this evening our guests added much to the pleasure of the meeting, and we enjoyed a most delightful address by Dr. Emil Beck, on "The Treatment of Sinuses of the Head by Means of Bismuth Paste." We all know what a reputation Beck's paste has made as a healer, but not all of us have been able to obtain satisfaction from its use; however, the very explicit manner in which Dr. Beck explained the indications for and the methods of application of this useful remedy will surely enable us to accomplish the desired results in the future. The case exhibited was most interesting and showed the efficacy of the treatment in the hands of Dr. Beck. We fully appreciated the kindness of the Doctor in coming to the meeting, and his thoughtfulness in giving us an opportunity to see the case at the completion of treatment. In the discussion we had the pleasure of listening to Dr. Gurnee Fellows—a member of another branch of the great healing art, and the other guests and members showed their interest in the subject by giving it a good discussion.

This program has given us a very profitable year, so far as the real work of the society is concerned. The papers have been fine and many points of both practical and scientific value have been presented to us.

SOME RECENT TENDENCIES IN PRACTICE.

BY ARTHUR G. SMITH, D. M. D., PEORIA, ILL.

I am writing this mainly because I have a lot of things on my mind that relate to subjects now being largely agitated and discussed in our profession.

I have been doing a good deal of what, in my case, is obliged to pass as thinking over some of the problems now confronting us, and I am going to sort of think on paper for a time.

Put into a single paragraph, the things I have been mainly studying over the past year or so are these: Are there really any such things as "common sense" and "clinical experience"? If so, have they any proper place in a dental practice?

Years ago I was forced to conclude that, even in the simplest cases, it was extremely difficult to exactly remove every shred of pulp tissue from a canal and fill the canal perfectly, exactly to the apex. In the cases of many molar roots, common honesty with myself forced me to the conclusion that this ideal result was frankly impossible. In all the discussion that has gone on through the years in regard to canal work I have seen no sufficient reason for changing my mind in regard to these conclusions.

If judged solely by the assertions of recent scientific investigators, *all* my root canal work has been extremely blameworthy. With regard to the technique of my root canal work, I will simply say that I have tried to do that which would give the best results to my patients—so far as I am able to estimate all round desirable results.

Here also I have fallen from grace according to the standards of those who lay down the law in these and other matters for us poor plodders who are out on the firing line trying to make good directly to the fellow who owns the tooth and pays the bill.

For a long time now I have been using one of the best known root fillings of commerce (in conjunction with carefully placed gutta percha cones). It is one of the so-called formalin-creosote preparations. I started timidly and half ashamed—but in a sort of desperation of dissatisfaction over the results obtained by other means. As soon as I made this change my percentage of successes began to increase decidedly and I have used that same preparation even unto this day and I see no good reason as yet for abandoning it, provided that there really are such things as I inquired about at the beginning of this article.

The practical aspects of my canal work are these:

I no longer attempt to enlarge the apical third of any canal.

I know perfectly well that in the cases of very many molar roots I fall short of getting all the pulp tissue out. In a few cases their openings have been entirely sealed—several times this has been the case in even an upper central. These teeth have been filled as best I was able and notes made on my records of their known or suspected imperfections. What has been the result of all this? So far as I know there has never a single case of trouble resulted in any of the six anterior teeth. Occasionally lameness and abscess have developed in a bicuspid or molar. These teeth have been extracted whenever such trouble appeared—or at least every effort has been made to make the patient consent to such extraction.

I have pulpless teeth treated and filled in this way in my own mouth, in the mouths of different members of my family, and in the mouths of hundreds of patients who are under my care year in and year out. If comfort, usefulness, efficiency, and beauty really mean anything my efforts have not been unworthy. Yet according to the modern preachments I should be in jail for all these things, and not trying to conduct a dental practice.

What is the answer? I am free to say that I don't exactly know, and to the best of my knowledge, neither does anybody else!

One thing, however, I *do* know; and that is that a lot of the stuff that is being written and read and published nowadays along these lines is very far from the ordinarily observed facts and conditions of practice.

For example. Do you believe that an X-ray film will show that any root whatsover has been prefectly cleaned and filled? I certainly do not believe it, and for these reasons. The root with only one distinct foramen is, as a matter of fact, rather the exception, yet how often do you see an X-ray picture which even intimates that more than a single opening exists at the apex? *This in the simplest and easiest cases.* What of the X-ray in the hard cases of the molars. Here the X-ray, like everything else, renders the very poorest service just where we need the most help, for the shadows are often overlaid, crossed or duplicated in a way to render really accurate reading impossible. In some planes root curvature is well shown, in other planes it can at best be only guessed at. In the cases of lower molars and upper bicuspids with bifurcated roots or canals, the shadows are necessarily overlaid and so indistinct and unreliable. Furthermore there does not exist, so far as my own personal observation goes, any *fixed* relation between apical infection and imperfect or perfect root canal work. Roots which show up well as to filling will be the source of infection, while other roots in the same mouth will show no trouble whatever in spite of the fact that the radiograph shows extremely poor handling of the root canals.

In all this I am not at all belittling the X-ray or its importance in our daily practice. I would not know "How to keep house without it," but to say that in all cases one can prove by this means, and visibly demonstrate to the admiring patient that his roots are perfectly filled even if his pocket is perfectly empty is going far beyond the warrant of actual facts as I interpret them.

Furthermore: What is an "Apical Space"?

Answer: "There *ain't* no sich a animal!"

When I read about "Coating the end of the root in the apical space with chloropercha" (quoted from a recent magazine article), I shed tears and profanity in about equal proportions, to think that anyone can get into print with statements so far removed from the stern realities of possible accomplishment.

Chloropercha may be forced through a fistulous opening almost certainly, it may be forced into a "blind abscess" *possibly* (?), but it will flow over, coat and adhere to, a root end *never* so far as my personal observation goes.

If some pulpless teeth do, in some cases, cause the troubles and infections in various portions of the body that are now being charged against them (and I regard it as an established fact that they do as charged), then the real situation is that *any* pulpless tooth—no matter how or by whom filled—*may* cause exactly such infection. Better work is desirable, and we should all try our very best to improve as rapidly as possible along this as well as along all other lines, but this improvement will only result in more or less lowering the percentage of these troubles, never changing their character or eliminating them utterly.

Which being interpreted means: If we consider *only* the entire elimination of the systemic affections caused by pulpless teeth, the one right thing to do is to *never* allow any pulpless tooth to remain in any mouth whatsoever. This position, lived up to, would eliminate at one stroke a majority of all our work —would put beyond the pale of real relief practically all cases that most need our help and services.

This brings up another point.

What is the object of human life, anyhow? Is mere length of days the chief end and aim of earthly existence? "Not so you can notice it!" When you stop and think of it, is it not really astonishing how little thought is ever given, by the world at large, to the matter of *how long* any one individual has lived? The late Mr. Methuselah—undisputed holder of all professional and amateur longevity records—is very seldom mentioned in the press dispatches these days. In the race for fame and glory he has been passed by literally thousands of men who were on earth only a few minutes compared to the staggering total he succeeded in attaining.

No! The great question about life is not how long will the thing keep up, but rather how much is it worth to me and the rest of the world while it's going on?

Efficiency, comfort, usefulness, beauty, these are some of the terms in which life is really measured and the scope of these terms is not increased by the loss of the natural teeth in the great majority of cases.

An occasional infection in the individual, through the retention of a pulpless tooth is a very unfortunate thing—true enough, but the certain lowering of efficiency of thousands of people through extraction of every pulpless tooth is a vastly more unfortunate thing if I am any judge in such matters.

How does the thing work out practically? Knowing all the hue and cry over this matter and having several pulpless teeth in my own mouth do I rush off and have them taken out? No indeed. Do I carry home a pocket full of forceps at eventide and cheer my family up a whole lot by telling them the glad tidings of great peace and lots of pieces? Hardly.

A prominent surgeon in this part of the state (a young man who, in his student days in Chicago, was the patient of men in our profession who stand as high as any) was recently in my chair for some very extensive bridge and inlay restorations. He had been reading up on the subject and debating it with himself for months. When he came to me he was as well posted on all the matters pertaining to possible mouth conditions as any man I have ever met. We went over the matter together as well as we knew how, with the result that in spite of all that we had both heard of the possibilities of trouble in some cases of pulpless teeth he nevertheless decided to "take a chance" and had his mouth practically filled with work that was, every particle of it, mounted on pulpless roots. He is delighted with the result. Says that his mouth feels cleaner and better than it has in years. I feel sure that he bases his belief on facts.

Many years ago a man over 60 came tc me with very bad mouth conditions. Pyorrhea, abscesses, caries, all cheerfully answered "Present" when the roll of dishonor was called. I did all I could for him, but I was never able to get him to the point of having a root extracted under any circumstances. He simply waited until outraged nature threw them out.

Such teeth and roots as were in any sort of condition for restoration I placed in as good order as my skill would permit; however the conditions in this mouth remained very far indeed from even the minimum requirements of health and cleanliness. To my certain knowledge there was not a time in the twenty years that this patient was under my care that pus and abscesses were not present in his mouth. Added to this was the matter of advanced age and sedentary habit. As a result of all this, patient never had a particle of trouble with any of the diseases that are occasionally due to bad mouth conditions. At the tender age of 87 his then active career was terminated by a trolley car.

Woman, single, 23 years of age. For several years had been confined to bed most of the time with "rheumatism." General mouth conditions fairly good but caries rampant. In desperation I crowned the six upper anterior teeth. Did all the work with the patient flat on her back in bed. At this time patient weighed about 75 pounds and her life was despaired of by her family and friends. (It was in fact a sort of desire to humor the wishes of the dying that led them to have me do any work at all for her.) Soon after the work was done patient began to improve. In two months was fully recovered, nor has she been sick again since, though the work mentioned was done some seven years ago. This patient now has no less than 16 pulpless teeth in her mouth and weighs 160 pounds.

But why go on? Any practictioner of experience can supplement the list already given with a dozen or more from his practice which illustrate the point as well or better than those cited.

Of course everybody should take care of their teeth and *never* lose one or let a cavity get to the pulp—but alas that fair day is a long way over the hill as yet. In the mean time, we are not going to extract every innocent pulpless tooth any more than we are going to give up riding in automobiles over grade crossings, or using the railroad and steamship lines—all of which we do in spite of the well known dangers thereupon attending—but just as in the case of these things, we are going to keep trying to make that use safer and better as time goes on.

I don't submit this article as a finished literary production—it has been written on at odd moments for more than a month.

All I have tried to do is to digest the thing from the standpoint of a practitioner, who sincerely wants to benefit his fellow man in the really largest and best way. I have tried very hard to be honest, to look at all my work squarely, and not to juggle with facts in even the smallest degree.

As time goes on I become more and more in earnest over my work. I see each day what it really means to cover this little section of the job of keeping the human machine in repair and running order. Steadily my passion for clean cut and permanent work increases. Perhaps many would say that all this doesn't square with what I said in the beginning with regard to my methods of operating. To all such I simply submit the results as they stand in the mouths of my patients; if these do not justify me, then indeed I stand convicted on evidence that I have made myself.

THREE YEARS AND SOME MORE.*

BY FRANKLIN B. CLEMMER, D. D. S., CHICAGO, ILL.

The honor and pleasure of presenting a paper before this body was mine two years ago. After fruitless pleading to spare you, your programme committee is again inflicting my faiths, beliefs, suspicions, and enthusiasm in N_2 O & O Analgesia upon your tired ears and brains; and I can only cry out in palliation, like Adam of old, "She tempted me and I did eat." And very much, I do believe, like the wail of the exhorter of the gospel, strong and emphatic as the exhortations may be, potent with good, resplendent with promises, a "land flowing with milk and honey," contentment and satisfaction, I will be compelled to say at the end, "All is vanity"; for the number who heed the voice of the "one crying in the (dental) wilderness" will, no doubt, be as small as at the last presentation of the same subject.

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*Read before the Northern Illinois Dental Society, October, 1915.

And why, I ask, should it be so? Is it that the subject of the elimination of pain in our work is of less value to all concerned than the question as to the best way to construct a piece of bridgework? Is it true that the work made easy for the patient becomes doubly hard for the dentist? Is it true that unless we hurt, our work is of poor quality? Away with such sophistry! When the Barber's Guild, after much travail, gave to the world its first born, the dental trade—which since has become a profession the which there is none greater—pain unlimited was its ally. Follow the upward trend, as it aged and grew, and you will find that not only mechanical ability grew with it, but also the slow consciousness that the unnecessary pain was inconsistent, and should become obsolete by scientific application and persevering labors in that direction.

Go back, if you will, to the dark ages, so called, and learn how by the use of mendragora root, henbane, hemp, hemlock, etc., man was endeavoring to stupefy the senses for the while, when about to undergo physical pain. They strove to remove the fear, subdue the racking nerves, and thereby give surcease to the diseased body. And yet, when mention is made of allaying the agonizing pain of tooth repair some of our good friends decry it, and say it is contrary to good dentistry. Let me say right here that the accusation made, that by the use of analgesia, cavities are poorly prepared, is false in its entirety; for the man who will do faulty work while working under analgesia will do as bad, if not worse, where it is not used. Thorough work of any character is dependent on the mental and conscientious fiber of the workman. It is said that a poor workman blames his tools, and no doubt by the same line of reasoning there are many poor tools in our own profession.

It may be the process of evolution; it may be the vacillating mental status; it may be the still hunt for the unattainable; it may be just plain grasshopperitis, that causes our profession to swing from one extreme to the other; here resting a moment and then away to the next new thing, never fixed or satisfied. What was good yesterday is bad today, and tomorrow will spoil today's.

Some years ago it was implantation; a short rest by the waters of knowledge, and then on to the next new thing—

cataphoresis; a wild enthusiasm for a moment and a long row of dead pulps later; the perfected malleted gold filling, and then the Eureka of all, the inlay—porcelain and gold—vieing for first place, and the race still on. Then came N_2 O & O Analgesia (and here is where I stopped and am still stopping). Not content, the general enthusiasm has subsided for analgesia, only to chase another ignis fatuus in the shape of conductive anesthesia. The neophytes rush pell-mell, much as the honey-bee when the nectar is full in the flower cups, fearful lest some escape. And the years will not be many until some one will ask if you ever used conductive anesthesia or its predecessors, and you will look up in wonder, gaze absently into space, and try to recall where you once heard those terms. So why not let us pause in the mad rush and see if out of the record of the years we cannot gather some food for reflection? Let us endeavor to hold fast to that which is good; and possibly the bread we cast on the waters may later return a hundredfold to those who still look at the dentist and his work as the last horror before annihilation.

The subject of this paper is "Three years and some more," and pertains to the essayist's experience in the use of N_2 O & O in his daily practice. The parent has the unassailable right to call his child by whatsoever name he desires; and in giving this "brat" the cognomen as above stated, it was with no desire to parallel a romance in recent years with the title in some ways similar.

In the three years and more that the speaker has used analgesia, a record has been kept, and it foots up something like fifteen hundred separate operations, including cavity preparation, denuding teeth for crowns, intentional pulp exposure and extirpation. I have no hesitancy in saying that not all were absolutely a one hundred per cent success. And as I look at work that comes into my office, I am forced to believe that *full* success is not the measure alloted to *any* work. But this I do know: the story oft repeated is one of much suffering inflicted during the progress of dental work. Deducting fifty per cent for magnification of the pain by expectancy, and retelling, there yet remains a generous margin where analgesia is pre-eminent for the purposes for which it is intended; the finished work as good, if not better, than where it is not used.

Let us ask why use N_2 O & O for painful conditions about the teeth? First and above all is this; the one in the chair has a right to the best that we can give; and he who does not use something to produce painlessness, or nearly so, is not giving the best. Second, the strain on both patient and operator is lessened to such an extent that they leave the chair without fatigue, and both are gratified. Third, the safety (compartively) conduces to mental calm, and works for good to both alike. Fourth, more work can be done in less time, thereby inhibiting dental fatigue, which is a forerunner of shock. Be it now said that shock is the one big factor in our work—it matters not what that work may be; and will be so as long as we have psychic and physical conditions with which to contend. The gratitude of pleased patients that pain is abolished, that from now on the dental chair has no horrors, probably is one of the greatest, if not the greatest boon, in the use of analgesia. We all know that people neglect their teeth very largely because of the well-known pain awaiting them; and like the ostrich that sticks his head in the sand, thereby feeling safe from the enemy, they postpone, thinking time will forget the damage to their teeth, and the arch-enemy, the dentist, will not get them. But when analgesia is carried to their intelligence, and it travels, believe me in this, we have a better chance to repair the damage with the least consumption of nerve energy.

The wife of a dentist said to me, "I wish you would convert my husband to the use of that stuff, for he certainly hurts when he fixes my teeth." *There* was a case, had the husband heeded, where he might have had a continuous honeymoon, but he willed not, and at this time I know not whether a "To Rent" sign hangs in his parlor window or not. At any rate they, who by the use of analgesia have once enjoyed the abolishment of fear, that great progenitor of physical and mental pain, do, as it is said of babies for Castoria, "cry for it," and lusty is the voice.

Now, let us ask why should we *not* use it? I get as far as the end of the question, and in spite of all that I have read —and I have scoured about all the dental journals published, noted the reasons given, weighed them carefully, read, I believe, between the lines—and after thorough analysis, I confess that cost of producing analgesia, lack of confidence, or total ignorance on the subject but an unwarranted bias notwithstanding, are about the only cogent reasons stated.

It is rather amusing, if not illuminating, to hear a dentist speak of "our beloved Horace Wells," etc., etc., and yet, being asked if he uses analgesia, one of the stages Horace Wells had to go through in order to have his molar removed, and in high dudgeon replying, "I should say not," is handing that man of 1844 a bunch of immortelles and then ruthlessly taking them from him.

If I read the history of anesthesia rightly, Horace Wells became an enthusiast for nitrous oxid after witnessing the induction upon a man who, becoming unconscious, fell and wounded himself, and yet without knowledge of the fact. But here is where Dr. Wells lives in our profession. He was a young man of keen perception, highly organized mentally, and being so, decided to have nitrous oxid tried upon himself for the removal of a tooth, and the operation was a success. The dental world was young then; and the blood of youth runs swift, so he popularized his experience, and would have enjoyed very much longer the honor of being the first man to have a tooth extracted under the influence of this wonderful agent, had it not been for an unfortunate incident in the Massachusetts General Hospital, where he endeavored to remove a tooth without pain and failed. One failure doomed him to days of misery and shame, and a few years later life ebbed out of a severed artery in his wrist. The lesson is plain. It is with us today in analgesia; and it is where many men who have tried it, stop—at the first or second unsuccessful attempt. The story of Robert Bruce is fresh in your minds; how he watched a spider endeavor to throw his web from rafter to rafter in the room in which Bruce was living, Eight times! and then the feat was accomplished. In that beautiful poem, "Bitter Sweet" by J. G. Holland are these fine lines, and they aptly describe our limitations and our aspirations:

"Heaven is not gained by a single bound:
We build the ladder by which we rise
From the lowly earth to the vaulted skies,
And we mount to the summit, round by round.
I count this thing to be grandly true:
That a noble deed is a step toward God,
Lifting the soul from the common sod
To a purer air, and a broader view."

We cannot, we dare not stop because of one poor effort, but seeking out the weak points, at it again. If a thing is good, it is good inherently, and not because of an expressed belief. The lack of confidence displayed in any line of work spells ruin, unless checked up by intelligent observation and endeavor; and when I read of men who say they have no faith in the efficacy of analgesia, two things can be true only: they have not applied the remedy with discernment, or they are obstinate in their bias. Give me a man who will earnestly seek the light, though in darkness, and I will give you an Edison, a Marconi, a Senn, a Greene Vardaman Black. Such must be the spirit of him who succeeds in anything, and in alagesia there is no exception to this fundamental truth.

It has been stated that a dentist should not use general anesthetics, and for the reason that his knowledge of physical diagnosis is insufficient; that the action on the vital organs is by him unknown; that death lurks in every administration, etc. If the dentist has not the ability, time or disposition to search into the requisites of practice he should at least absorb the findings of men whose brains are their laboratories, and who, after painstaking researches give to the profession these very truths. When Dr. Crile states above his name that the heart, liver, lungs, kidneys and nerves take on no degenerative activity by reason of N_2O & O the essayist must accept, for a greater mind has spoken.

It is so easy to confound suppositions and facts. The first are mere ideas running wild; the second are tried and proved, not by one or two experiments, but by stern investigation and application, until the truth has been laid bare. The statement being made that the vital organs of the body are affected by analgesia, allow me to quote some authorities. Dr. Fenton B. Turck of Chicago some years ago carried out a series of experiments with reference to the use of chloroform and ether on animals, with a view to determining the changes that take place in the blood during anesthesia. It was found that there was a loss in the anti-bodies or ferments of the blood, and that there was a diminished resistance to the bacteria, such as agglutination of the precipitins and other substances which he found in the anti-bodies in the blood. It was found that these animals went into collapse; and shock is induced very early in animals that have a lowered condition of the blood. Also, that there is a marked diminution in the anti-bodies, the ferments, the precipitins, and other substances. Dr. Turck carried on a number of experiments demonstrating these changes, also showing the effect of ether and chloroform on the serum itself. He concluded from these experiments that there were two conditions met with—one, that ether and chloroform had an actual, direct, chemical effect on the serum; the other, that biological changes took place and acted on the cells as a toxin. When he used N_2O & O anesthesia, none of these chemical changes took place.

Dr. Graham of Chicago has shown in his experiments that ether affects phagocytosis, thereby lowering the immunity of the patient from shock and infection. N_2O does not affect the phagocytic action of the blood, so that a patient anesthetized with N_2O has a higher immunity from shock and infection than has a patient to whom ether has been administered.

Dr. George W. Crile of Cleveland has carried out experimental and clinical researches comparing nitrous oxid and ether anesthesia. He says, "The changes in the ganglion cells of the central nervous system from the vortex to the cord, as indicated by the new pathology of cytology methods, show a distinct difference between the cells in the ether and nitrous oxid animals. The cells of the nitrous oxid animals showed much less change than in the ether animals. There is apparently no post-anesthetic effect upon either the lungs or the kidneys, nor indeed upon any other part of the body. Then, too, in infections, since using nitrous oxid as contrasted with ether, we are equally certain that ether as compared with nitrous oxid impairs the immunity of the patient. There is unmistakably a great diminution in surgical shock. Indeed, the immunity from shock is as striking in the clinic as in the laboratory." Dr. Crile has also stated that under N_2O a patient will endure approximately four times the amount of operative trauma as under ether: also that it has the advantage of blocking the damaging nerve impulses to the brain cells, thereby conserving the nerve waste, and preventing shock.

These conclusions just quoted cannot be otherwise than accepted by thoughtful practitioners; and on them must I pin my faith.

There is at present a strong leaning toward conductive anesthesia, and under certain limitations this form of painless work is admirable. I dare say the man who uses analgesia can have his cavities prepared before the conductive operator has touched a drill to the teeth, and the after effects are nil. With conductive anesthesia the effect is felt for hours, and the face is sore for days. Novacain may be seven times less toxic than cocain, but it is well not to rely too firmly on this seventh potency. And when this synthetic poison is sent into the circulation it is a hard matter to counteract its toxic influence. I have asked patients which they would prefer—a two inch needle thrust into their tissues, or the inhalations of N_2O & O. The very thought of the deep penetration was shocking to them, as it would be to most of us. And with that it has been proved that seldom does the needle reach the expected place. The reports of broken needles left in the tissues are beginning to be heard, and more will follow. I do not decry conductive anesthesia, but this I do say: that of the two methods, the preponderance of evidence is in favor of analgesia. There is one serious objection to analgesia as compared to conductive anesthesia. One must in the former expend considerable money to be properly equipped. That hurts some dentists more than a dull bur in a sensitive tooth. You will find men making a "flush" in matters of automobiles, while their offices have in them but the bare necessities. The belief holds that that which we desire beyond all else is attainable, regardless. The expenditure of but a few dollars enables one to use conductive anesthesia, and this alone has caused many men to give it their preference.

What is the trouble with the dentist who does not get results with analgesia? The vehicle cannot be at fault, for its purpose is as fixed as the North Star. It is safe to say that it is in the man himself. He who goes at his work half-heartedly, lacking in confidence, cannot impress his patient with success of the outcome. And here is where the psychology of the patient and operator must blend. The operator using analgesia, if he would be successful, must impress his patient with the fact that he is master of the situation, capable of overcoming any objections that may arise, assuring that all will be well and the experience about to be undergone will be pleasant. No need of subterfuge or misrepresentation, in fact both are inadmissible, and if used will bring but contumely upon him. It has been the experience of the speaker that plain common sense, rightly used, is the open sesame to this method of practice; and when the patient again returns, after a period of months, for more work, and expresses no fear, or dread, but calmly states in the most perfunctory way that he desires analgesia, there is a satisfaction in knowing that past efforts to minimize human suffering have not been fruitless.

In conjunction with the psychic influence of operator toward patient, can aptly be added that of the office. On this one idea alone could be written a paper,—and probably will be later—most interesting and instructive. A dentist may be ever so efficient, and yet his office surroundings arouse distrust in the new patient. I take it that a bright cheery office, splendidly equipped, clean and inviting, impresses the one seeking service far more than the character of work done. I speak not in defense of an elaborate office as a "blind" for poor dentistry: far from it. But it behooves a dentist to see that his office, from the reception-room door knob to the dental chair is one of increasing psychological importance. Then, when suggestion is made for the use of analgesia, everything is in harmony with the new method, and the patient is in a receptive mood. I have seen many offices that needed regeneration to an alarming extent, and were they made so, the dentists occupying those offices would feel the importance of their work, and more generally good work result. From some of these offices I have gone, and instinctively came into the mind that old song,—"They kept the pig in the parlor." In such offices, gentlemen, analgesia bids fair to become a failure, for the mind there is not attuned to the higher and better things in our profession. We must "hitch our wagon to a star" if success is ever attained. The common-place is the road of the self satisfied; and if in these rambling thoughts some listener gets a vision, the speaker has been well paid.

Now what should be the requirements of a successful analgesiant? As I look at this phase of the subject, he must at least not have a displeasing personality. Ego is not personality, but vulgarity. The crowding down into a corner, of the patient's intelligence, to the supreme elevation of the dentist's, is foolishness in the extreme. But that which gives the impression of genial good nature, not assumed, a sympathy that is not sloppy, an honest laugh, a receptivity of the other's viewpoint, these and many more do, and can, enter into personality. Associated with what has just been enumerated, must be intelligence, knowledge of the anesthetic, with its limitations and possibilities. And having the last named, use firmness to carry out the line of work. To take up the work and be calm, even when the patient is restless, showing no excitement, fills the patient with confidence, and that, coupled with suggestive force, carries the work to a successful conclusion.

Analgesia abounds with so much in its favor, rightly used, and so little in its disfavor, that it is astounding why more dentists do not learn to know its true value. It has been tried, tested, proved, and found not wanting. The mechanical side of our work has had such strong impetus that it is time we devoted more to the amelioration of pain. It is well to remember that the one in the chair has not the same view point as the one by the chair. But if you take time to study the face that belongs to the one in your "Columbia Favorite" methinks it will not show an expression of unalloyed bliss. We must depart somewhat from the mechanical paths we have made, and educate the people we serve, that prevention of pain, accompanied with thorough work, the re-establishment of dental health, the conservation of tooth, the relief from cringing by the afflicted, the removal of fear, the enjoyment of sound teeth, the healthy mouth as a potent factor for a healthy body, these all are the essentials of present day dentistry. Then and then only will we be to the masses something beside "tooth-carpenters." Personally, I do not object to the word "carpenter" for I read that the Man of Galilee was a carpenter, and He put His sacred seal on the calling. But the implied anathema is displeasing, and may the hope be realized that the time is not far distant when the honest, conscientious dentist may take his place high up in the scale of general appreciation, and rank with other benefactors of the human race. And this can be by taking hold and grasping the great possibilities of analgesia.

The honest seeker, he who feels the throbs of progress beating in his brain, and will follow up the desire by sincere investigation, will arrive at the point where success and he will fraternize; and analgesia in his work will be the practice that will lift him above the commonplace. He will then become a dental benefactor, his patients will rise up an call him blessed, and the night will find him with a song on his lips. If a man has knowledge he has the first requisite of success: if he applies that knowledge he is bringing, compelling, success to him. To merely acquire and not use to the limit is "hiding the talent in a napkin."

Some one has said, "He profits most who serves best." And he who serves best gives the very best in him, unfettered by mercenary motives, unselfish and altruistic.

The speaker is fully aware that the ideas presented in this paper are not in harmony with those of some men eminent in the profession. The truth as we see it is truth to us. Is it palpable to others? Has a chimerical fancy seized the intellect and subsidized it to folly? To avoid criticism one should say nothing, do nothing, be nothing. The choice has been made. Let me advise you as one who has taken the waters and been cured. Pause and reflect; which really means be openminded to progress; be willing to believe all is not in the past, and so knowing, apply the wisdom with which God has endowed you. Search out the kernels of truth, and as they may be revealed, apply them scientifically, courageously, looking always for something bigger and grander than now is. And the days will have wings of light, the mind will revel over deeds well done; and your profession, my profession, will take on the halo of a heaven sent mission—the elimination of pain through the beneficence of Nitrous Oxid and Oxygen.

CHEMICAL TREATMENT FOR PYORRHEA ALVEOLARIS-NECROTIC TISSUE.*

BY J. S. BRIDGES, D. D. S., CHICAGO, ILL.

Mr. President and Members of the Northern Illinois Dental Society: During April of the present year I first presented this treatment to the dental profession through a paper read before the Odontological Society of Chicago. Knowledge of attending results and method of procedure were then in a very embryonic stage. However, since that date the many cases treated have responded in a most gratifying manner.

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*Read before the Northern Illinois Dental Society, October, 1915.

The variety of types treated has been extensive, from the young, illy-nourished, maturing child of twelve to the man of eighty. Also the syphilitic, the gouty, as well as those suffering from mechanical abrasions only.

While it is scarcely wise to claim a disease springing from such diversified sources can be cured by one compound alone, yet the results have been astonishing.

Before beginning treatment, in all the cases clinical analyses of secretions taken from around the teeth have been made. Despite the fact that the majority of these patients have been treated by various other methods, in the hands of some of our most successful operators, these analyses have shown the presence of various pathogenic germs, pertaining to pyorrhea; which analyses, made after the course of treatment, have in every case proven to be absent.

VACCINES

Of the methods in vogue, vaccines are probably the least used of all. Whatever benefit may result is often offset by the undesirable reactions likely to occur from too frequent hypodermic injections, especially when their use conduces to mental anxiety and physical depression.

LOCAL APPLICATION (LIQUID)

Local application of germicides in the form of liquid should have met with far better results during the many years of effort along this line, if there was not some radical weakness, for certainly they had power to destroy bacteria, wonderfully in the test tube, but fell far short when applied to the mouth. Why? Because the liquid is so rapidly dispersed by the fluids of the oral cavity, that it fails to kill more than a part of the germs, leaving others to propagate not visible to the eye, perhpas, but always present under the microscope.

MECHANICAL TREATMENT

Of the methods in use, mechanical treatment is the most likely to give the largest percentage of favorable results; for, whatever means of relief is under consideration, proper cleaning and polishing are absolutely essential, although perhaps not so minutely as is sometimes supposed. However, a smooth surface free from foreign deposits is absolutely necessary, although too severe scrapings of the root surface endanger the lacunae, which are but a short distance under the surface of the cementum, and once these minute depressions are exposed, a receptacle for bacteria that is a constant menace, is present.

A method combining a well-balanced use of instrumentation, followed at repeated intervals by an application of chemicals that persistently and constantly dispense their virtues from treatment to treatment is the rational and logical means of reaching a real cure.

TREATMENT

The major portion of my treatment consists of a paste and an astringent and cleansing liquid:

The liquid

℞

5%	trichloracetic acid crystals,
2%	adrenalin chlorid,
25%	normal salt solution,
68%	H_2O_2,

is applied as follows:

After thoroughly scaling the teeth, the use of a mixture of this solution and pumice, or precipitated tricalcium phosphate, is especially advised at intervals during the progress of the treatment. This is followed by an application of the liquid to the infected parts, by means of a blunt-pointed, all-glass tuberculin syringe.

PASTE

The paste contains magnesium sulphate; zinc oxid; bismuth subnitrate; tincture of iodin, 35%; aconite, U. S. P.; eugenol; phenol crystals; lanolin and alcohol. Owing to peculiarities of these constituents, all of which are essential to the successful operation of the paste, its compounding is a long and complicated process. For instance, after the ingredients are first mixed, the resulting paste is placed in an air-tight receptacle for at least two weeks, and is then re-worked, and again set aside to mature.

When properly compounded, and injected about the teeth, it will remain in position around the gums and in the root pockets and will be persistently active for forty-eight hours, without producing the slightest irritation to the tissues.

Magnesium sulphate is used in the formula because of its power to break up the albumin that otherwise would prevent our reaching the deep-seated pus sacs. Chemical antiseptics to be efficacious must reach these sacs or the infected foci by penetration, but without destruction of the tissue cells.

As an active solvent of albumin, it is reasonable to assume magnesium sulphate assists us in breaking into these foci.

Oxid of zinc given internally enters the blood as a lactate or chlorid, and acts as a mild astringent and nerve sedative, and, externally, it acts as a mild and soothing astringent.

Bismuth subnitrate is sedative, and a mild astringent when applied to mucous membranes, and an antiseptic.

Iodin promotes absorption of the products of acute inflammations.

Aconite is, when used externally, a sedative of the superficial nerves.

Eugenol, a phenol compound, is penetrating and stimulative.

Phenol, as you know, is a powerful disinfectant, and, as you also know, many of these drugs, if applied in too strong proportion, will destroy tissue.

Lanolin resists the action of water, and has the power to pass into the tissues, carrying with it any medicament with which it is charged.

DIRECTIONS

Before applying the paste, dry out the pockets and gum margins by isolation and by the very gentle use of air or bibulous paper points.

To operate the paste I use an ordinary hypodermic syringe, with a specially constructed flexible silver needle, having a well-beveled point.

I fill the syringe about two-thirds full, by removing cap covering the glass cylinder. (In sterilizing for subsequent treatment, it is only necessary to sterilize the needle, if care has been used in not drawing surplus from the point back into the cylinder.)

Gently insert the point of the needle well into the pocket, the beveled opening pressed firmly against the surface of the root, care being taken not to bring about hemorrhage, as the paste, to give the best results, must be used in an area as free from moisture as possible. After all gross signs of pus have disappeared, as well as in cases of gingivitis, spread a thin line of paste under the free margins of the gum and with the thumb and forefinger massage deep into the tissue. Treatment made every other day until a clinical analysis of a culture shows the mouth free of all pathogenic bacteria known to be elements in the production of so-called pyorrhea. It may be necessary for treatments to extend over a period varying from ten to sixty days, according to the severity of the case.

TABULATION OF CASES

	Streptococci	Staphylococci	Diphtheroid bacilli	Micrococci Catarrhalis	Pneumococci	Saprophytic bacilli
Before treatment, cultures examined showed	3	65	1	43	44	5
After treatment	0	0	0	38	35	1
Suspicious secretions and conditions where neither streptococci, staphylococci or diphtheroid bacilli were present						5
Total number cultures.....						73

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

On December 14, 1915, the Chicago Dental Society held memorial exercises for the late Dr. Greene Vardiman Black. The president, Dr. F. B. Moorehead, was in the chair. The invocation was by the Rev. Bishop William Fraser McDowell. A large audience was present and listened attentively to the program, which follows:

DEAN G. V. BLACK.

BY ABRAM WINEGARDNER HARRIS, PRESIDENT NORTHWESTERN UNIVERSITY.

I have been asked to speak of Dr. Black as a dean; others are to speak of him from different aspects. It will be my endeavor to keep to the topic assigned me, but it will be impossible to avoid excursions beyond my boundaries. for a man—unlike a ship—may not be laid off in compartments, since his every quality has its effect upon every other one. Speaking of the Dean, I cannot avoid speaking of the scholar, the friend, and the gentleman.

As an administrator in the common sense of that word, Dr. Black was not at his best. No one who knew him well will claim for him, I think, that he was a great executive in the usual meaning of that word. That he could be interested in details, and had the power to deal with them, is well known, but work ot that kind was not a consuming interest. As the Dean of the faculty, and the head of a large student body, he maintained his leadership and his headship, not so much by conventional methods as by other qualities, and this he did in a remarkable way. His success was as unusual as his methods.

He was a great dean, and among great deans he was like very few. Asking several of his colleagues in the faculty what they thought were the outstanding characteristics of Dr. Black as a dean, I received replies extremely interesting to me because they agreed in laying strss upon the same things. All of them mentioned his approachableness, and one of them drew a familiar and very pleasing picture of him as he was so often seen, with his arm over the shoulder of some young man to whose interests he was altogether given up. In that picture lay one of the telling secrets of his power with his pupils. He was a very human man who liked men, and, what is more, who liked young men, who knew how to sympathize with young men and how to lay bare to them his own enthusiasms and dreams. No one came into close contact with this man without the sure conviction that he was a friend of his pupils. With such a conviction once established in the minds of his classes ,there was little occasion for him to give his time and thought to petty and sordid problems of discipline.

He loved work; he loved his work. He had the genius of the teacher, and for him teaching was a profession and not a by-product of his professional career. His pupils—a multitude—will bear testimony to the truth of this statement. He knew how to make them see things clearly because he himself thought them out clearly. His was a robust intellect. Like other strong intellects, it was marked by keenness and accuracy; but unlike many, it was made effective by the qualities of courage, openmindedness and imagination. What he did was done thoroughly. He was remarkably free from prejudice, and not stubborn in holding to his hypothesis. He knew how to listen to other people and to facts, with a humble desire to know the truth.

He believed in his profession. Can anything more sad happen to a man than to live all his life in doing something in which he does not heartily believe? Dr. Black had no doubt that Dentistry was worth while and worthy of him and his best efforts. So far as I knew him, he was not much concerned over the financial advantage his work rendered him, but he was profoundly convinced of the blessing that Dentistry might confer upon humanity. He was a scholar uniquely fitted for the particular field in which he worked. He had imagination, without which creative scholarship is almost, if not quite, impossible; he had a keen, logical efficiency; he had boundless industry; and with all these qualities he had a consuming interest in his work. His liking for his profession, his courage and scholarship, made him a great power with his pupils, for, like Chaucer's priest, the way he pointed out to others he first went himself.

And yet he was not out of touch with others, even with humble men. He was a very modest man, who was never telling you what he had done, but rather stating what had been done. That he had been the doer was an accidental fact only. He was not only unconsciously modest, but he was troubled by anything that seemed to put him too much to the front. The honors that came to him seemed to give him more embarrassment than satisfaction. I remember very clearly one characteristic interview he had with me. An announcement in one of the Chicago papers, intended to occupy ten lines, by a mistake of the newspaper was set up as one hundred lines, thus magnifying the size of the signature by ten. He was greatly distressed at what seemed to be the immodesty of printing the name in such large type; and greatly relieved when I told him it seemed to me a matter of little consequence. And yet with all his modesty he had none of that self-conscious modesty or that egotistical timidity that makes a man hesitate to act. Modest though he was, he was not afraid to attack any problem that came to him.

In the selection of teachers for the faculty, he possessed one of the very highest qualifications for great faculty leadership. Perhaps there is no duty more important falling to the administrator of a school than the selection of the teachers. That duty he knew how to perform, and he built up about him a group of men remarkable in every department of the school work, administrative, teaching, investigation. He knew how to find ability and then how to breathe into it the breath of scholarship, how to impart to others his own enthusiasm for service. His faculty meetings were models—sociable, businesslike, and never without a fair share of the time given to reports on investigations, addresses, writing, and teaching methods. And with all these things he was a friend of his colleagues, who respected him but never feared him, who now mourn him with no perfunctory grief but with the sorrow of a friend who has lost a friend. There are none among those who worked with him who will not through life feel a lonely longing for the sound of the voice that is stilled.

DR. GREENE VARDIMAN BLACK: STUDENT, INVESTIGATOR AND INVENTOR.

BY FREDERICK B. NOYES, D. D. S., CHICAGO, ILL.

The few hundred years just past have often been called the centuries of science, because in them scientific studies have made such wonderful development and the results of scientific discovery have been so widely applied for the improvement of the conditions of human life. The greatly increased comfort, health, and efficiency, the growth of wealth, the development of personal comfort, manufacturing and commercial industry, and agricultural productiveness, have been the result of the application of scientific discovery to the improvement of the conditions of human life. But science is not the discovery of facts, nor the application of discovered facts to the improvement of living conditions. Science has sometimes been defined as the study of the relation of facts, the orderly and systematic arrangement of knowledge, or simply as classified knowledge. The study of science is not the learning of facts as one

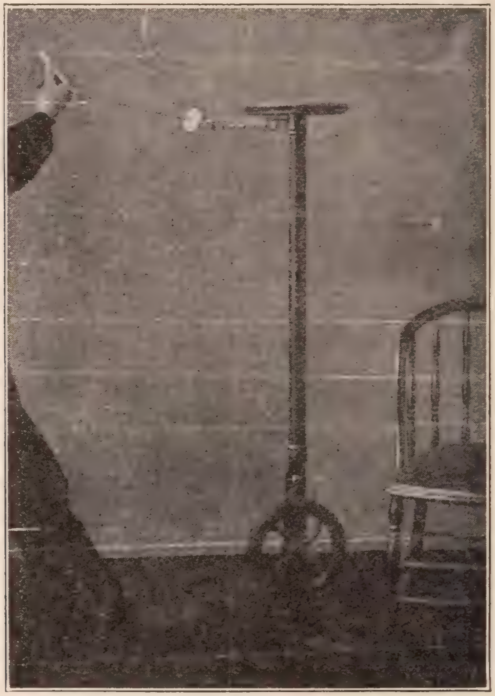

Fig. 1. One of the first models of a cord driven dental engine invented and constructed by Dr. Black about 1870. The cord from the fly wheel passes through the upright hollow standard to a wheel on the shaft.

might learn definitions from the dictionary; not the piling up of records of observations; nor the filling of museum cases with collected specimens. It is the study of the relation of every fact to every other fact; the seeking of an orderly and logical arrangement of the facts; the thinking upon and studying of the relationship of every individual manifestation to every other manifestation in the universe.

There are certain qualities of mind that must be present to make one great in science. The first of these is patience: patience to compile the facts; patience to spend days, weeks, months, years if necessary, to fill out the series of observations, and follow out the necessary relationships; patience to meet defeat by seeking its cause and eliminating one cause of failure after another. The second necessary quality is accuracy of observation; the ability to note conditions exactly to the minutest detail, without prejudice or the predetermined seeking for certain anticipated results. Thirdly is needed a logical faculty: the ability to reason correctly from the observed facts, to give each fact its proper weight and significance, and discover the relationship of cause and effect. The final quality, and most important of all, is a clear and true imagination: the ability to picture the unseen, to discover the significance of apparently unimportant observations, to catch the real meaning in a series of observations; the seeing of the unseen before it becomes real—this is the greatest qualification of all. That man becomes great in scientific fields who, viewing a series of observed facts, sees them drop into a sequence and order, his mind bridging the gaps so that he goes to work to fill in the spaces, until the sequence, instead of a partial one, becomes complete, and a great general principle is discovered.

I have sometimes thought that one reason why America has become so prominent in original scientific investigations in the last few years, was partly due to the recent frontier training of the American people. The conditions of frontier life made necessary, closeness of observation, and the correct interpretation or reasoning from the conditions observed. Life itself often depended on noting the footprint in the grass and recognizing it as made by friend or foe. All of the tricks of woodcraft are based upon correct reasoning from accurate observation.

Doctor Black possessed to a remarkable degree the qualities of mind essential to a great scientist. Both his natural mental endowment and his early training helped to make possible the greatness of his achievements. Let your imagination picture the Illinois prairies in 1848, and Doctor Black as a boy of twelve or thirteen, tall, slender, frail,—never rugged enough in health to do the ordi-

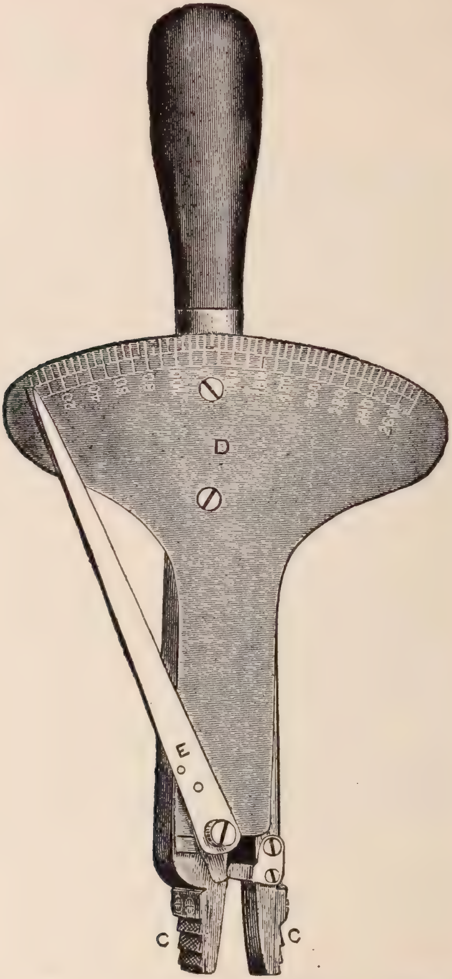

Fig. 2. The gnathodynamometer, designed for measuring the strength of the bite. C and C are rubber pads, which are placed between the teeth, and the pressure exerted is registered in pounds by the pointer moving along the scale.

nary work of a boy on a farm,—wandering through the prairies and the woods, often with his gun, and often without it, but always interested in every living thing, whether flower, plant, bird or beast,—always seeking to find how each animal or bird lived, its habits and its peculiarities. In these years he developed the love for the observation of natural phenomena which characterized his entire life. But even with the boy it seems always to have been the desire to know "why" things were so that led him in his studies. Doctor Black was a natural student. He could not see any unexplained condition without looking for its cause. The patience with which he made up for defects in his preliminary training is illustratetd in his study of chemistry. Realizing that he could not study living things without all the knowledge of chemistry that he could acquire, he equipped for himself a private chemical laboratory, organized a class in chemistry among the teachers in the high school at Jacksonville and others, and for a number of years taught this class.

One of the great broadening influences of Doctor Block's student life was a Literary Union. This met on Monday night. The membership was made up of people interested in literary and scientific affairs from the college, the schools, and the city. One person took charge of a single evening and presented something of interest, after which there was a general discussion. The members took the evenings in turn. Doctor Black once told me that they always met whether the Monday night fell on a Christmas or the Fourth of July, and that for more than twenty years he never missed a meeting!

Just pause to realize that it was in 1838 and 1839 that the cell theory was formulated by Schleidel and Schwam; that it was 1850 when Virchow challenged the world with his famous hypothesis that all cells are derived from a pre-existing cell. Doctor Black realized that to understand the human body in health and disease he must know as much about the working of the unit of life, or the cell, as he could attain. He went to work, therefore, with his microscope, not simply studying cells and tissues of the body, but every living creature that he could lay his hands on, large and small, and especially the protozoa of the ponds and ditches, those wonderful single-celled creatures. He dissected house flies and studied their parasites. He dissected the earth-worm and studied its circulation, and so on, taking up one subject after another, and following it as far as he could, or until his mind was satisfied. The old Doctor told me one time that during this period, he had a young lady assistant

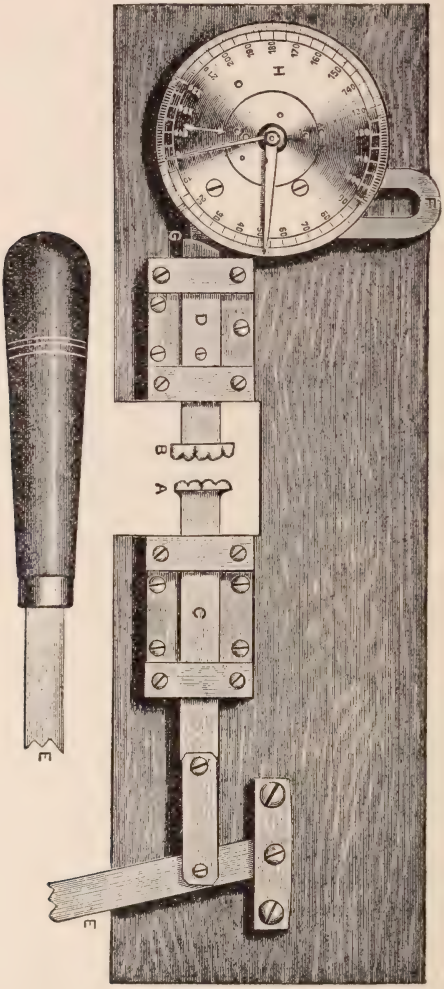

Fig. 3. The phagodynamometer, an instrument designed by Dr. Black to measure the force required to chew various foods. A and B are metal reproductions of occlusal surfaces of molar teeth, and the pressure exerted on food placed between these is registered on the dial.

who became very much interested in microscopic work. She mastered the technic of the preparation of specimens, and then, as the

Doctor said, used to try to stump the old man on something. She would mount bits of insects, or anything she could get her hands on, and give it to him under the microscope and ask him where it came from. And, as he said, in this way he got a tremendous experience in microscopic identification. He illustrated the result of this training with a story.

Many of the physicians of Jacksonville had gotten into the habit of sending specimens to him for microscopic examination. One day, as he was operating at the chair, the door opened and a man who gave special attention to eyes said:

"Here's something that I took out of a man's eye. I wish you'd examine it and tell me what it is."

He put a little vial on the desk. A few days later the same man stuck his head in the door and said:

"Well, did you find out what that was?"

Without looking up from his operation, Doctor Black replied:

"Yes. That was the first joint of the third leg of a potato bug."

"But," said the man, showing astonishment, "what was there about that to stir up such a terrible inflammation?"

"Why, that's easy," said Doctor Black. "At the base of the third leg of the potato bug there is a gland which secretes a poison and there was a bit of the gland sticking to the leg. Why," he added, "don't you remember, a few years ago when we could not get cantharadies to make a blister with, we used to grind up potato bugs and make a poultice of them, and it served the same purpose?"

"Yes," replied the other man, "I have done that often."

"Well," said Doctor Black, "it was the poison from this gland that acted as the counter-irritant in the poultice, and excited the inflammation in your patient's eye."

As a student, it was Doctor Black's habit to take up one subject at a time, follow it to its completion, put his results in careful form, and take up a new field. One is amazed at the number and the range of the subjects that he followed. I have read a manuscript, which was never published, in which he describes between thirty and forty varieties of house mold, their morphology, life history, and growth results. He studied the theory of music, became a very good performer on the violoncello, and for a number of years conducted the Sunday School orchestra in Jacksonville. He studied the weather, and methods of weather forecasting. He followed the records of the weather bureau back to their beginning in a study of the weather cycles in Illinois. And then studied the cross-sections of tree trunks, tracing the repetition of alternating series of wet and dry years,

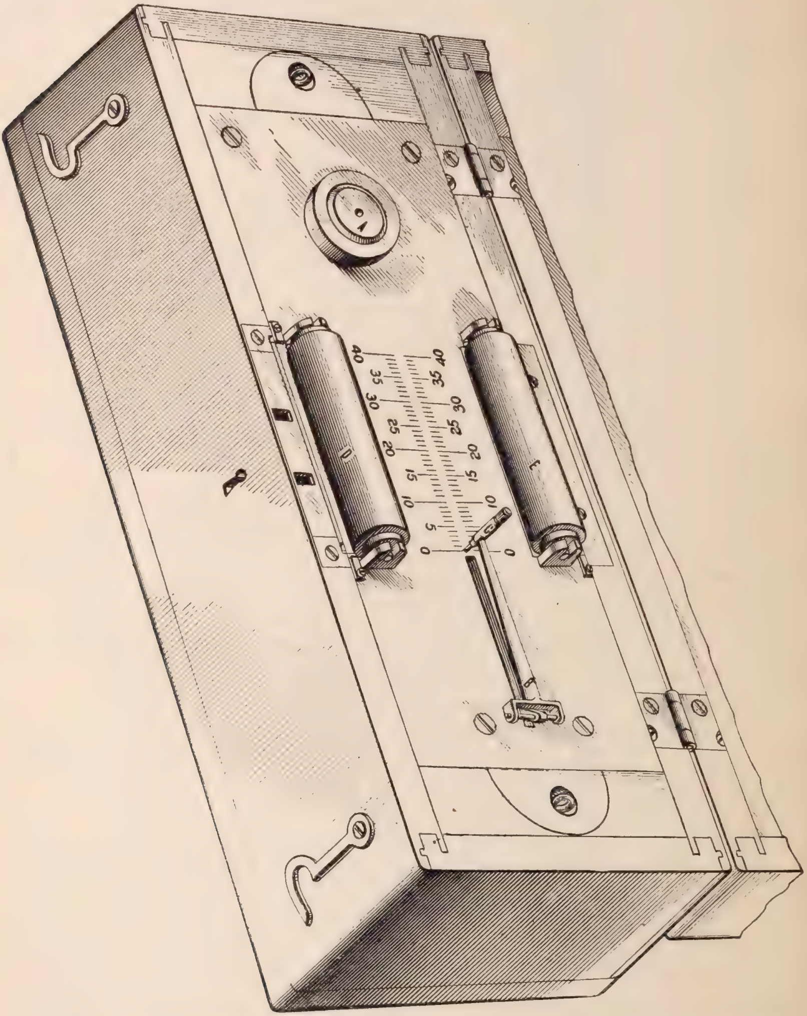

Fig. 4. The dentists' manudynamometer, designed by Dr. Black for measuring the force exerted by an instrument thrust, as the finger power in using a plugger, or excavator. The instrument is placed on the block A and when pressure is exerted the arm B, carrying a pencil at C, moves forward, registering the force in pounds, as shown by the scale. A paper, ruled according to the scale, may be placed under the rollers D and E, and this paper will be automatically moved with each thrust. Thus the pencil will record on the paper the force of each of a series of thrusts.

by the repetition of large and small rings, checking them with the recorded records of the weather bureau, and following them back into the past century. From a microscopic study of the grain of wood, he worked out a method of identifying fossil woods by the character of the grain and so determining the kind of tree from which they were made. He studied the science of sailing and navigation, and drew the plans and superintended the building of a boat about sixteen feet long and less than five feet wide, in which he sailed over large portions of Lakes Michigan and Huron, and in which he lived for months at a time.

As a student, Doctor Black's life should be the greatest inspiration to the young men of the profession. We often hear men say: "If I had only a better education,—or a chance to go to college,—or didn't have to work so hard,—or something else,—I would like to study." Doctor Black's life is a marvelous example of the result of individual effort. He had very little advantage in either general or professional education, but whenever he came in contact with something in his investigations which required a knowledge he did not possess, he left the subject of his investigation to painstakingly acquire a knowledge of the science or the language he needed, and then, equipped with it, returned to his investigation.

Throughout almost all of Doctor Black's student life, he was engaged in the active practice of his profession, and the support of his family, and his results are a wonderful example of what a comparatively small amount of time, systematically used, will produce. I remember well the Doctor's saying that for a good many years he gave the hour from five to six in the morning to his scientific studies.

Doctor Black was a born investigator. For him to study, was to follow original lines, while he never rested until he had found everything he could get his hands on related to his subject in English, French, and German. He always went to work as if no one else had ever attacked the field.

Time would fail me to even enumerate all of the subjects of his original investigation, but I wish to call attention to the order in which he undertook investigations in dentistry. I wish to emphasize the logical sequence of his work, for some day the dental profession will, I hope, waken from its dreams, in which, led by the lure of the pot of gold at the rainbow's end, it has followed fads and fancies

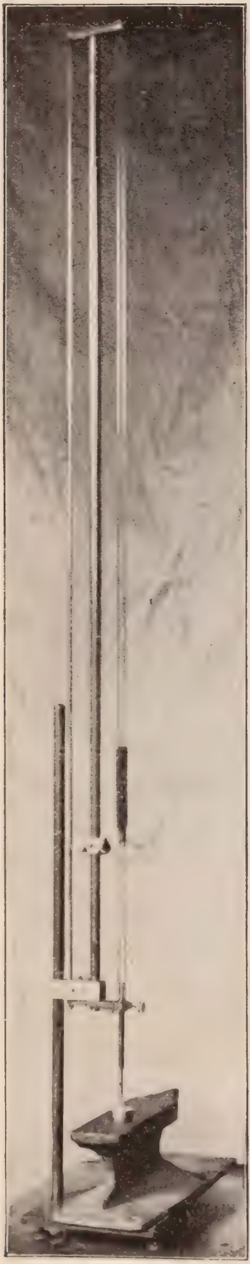

Fig. 5.

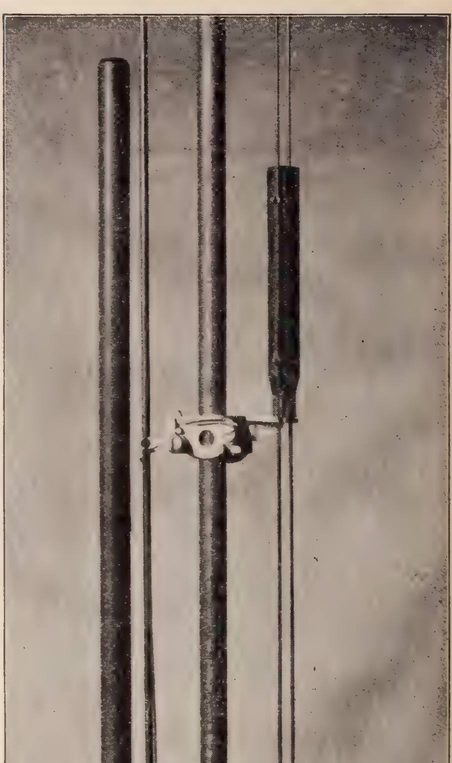

Fig 6.

Figs. 5 and 6. Falling weight apparatus, designed and constructed by Dr. Black, for the study and measurement of the force of mallet blows. The entire apparatus is shown in Fig 5, the more essential parts in Fig 6. It is 3 ft. 6 in. high, and consists of a rod supporting a tripping table which can be set at any desired height. A mallet of known weight is held in place by this table, and the mallet falls when the tripping table support is snapped from under it by pulling the cord. The mallet strikes a long handle plugger, the end of which is driven into a piece of brass or box-wood resting on an anvil.

The force of the particular blow is determined by learning how much force is required with a "pressure" machine to cause down the broad and easy road of popular demand, and brave and fearless men from its ranks will give their life and energy to making passable and easy for the feet of humanity the trail he blazed along the rugged mountains of cold facts.

First, stop to picture in your imagination the conditions under

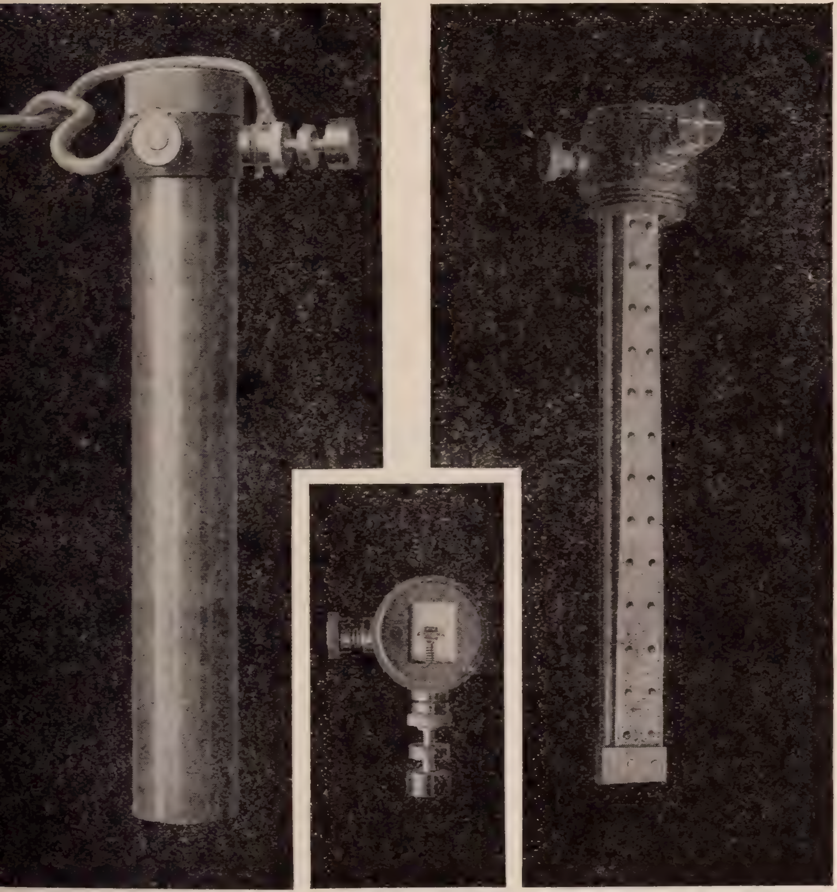

Fig. 7. Fig. 8. Fig. 9.

Figs. 7, 8 and 9. An electric thermostat designed by Dr. Black for bacteriological and ther dry ovens, and for water tanks. Fig. 7 shows the instrument enclosed in a brass ase, with wires attached. Figs. 8 and 9 show the thermostat. The brass rod holds the ower end stationary. Attached to this rod at its lower end is a double metal ribbon con-isting of a thin ribbon of aluminum and one of steel riveted together. The aluminum xpands more rapidly than the steel, consequently the ribbon is bent with the concavity n the steel side as the heat increases. A platinum point on the upper end makes and reaks the current with another point, which is adjustable with a thumbscrew. By this rrangement the lamp burns whenever the temperature drops below that for which the hermostat is set and is turned off when it rises above.

which Doctor Black began his investigations. Chemistry was still medieval; the modern nomenclature had not even been introduced; the cell theory was scarcely out of its swaddling clothes; bacteriology was just born; and immunity, antitoxins, and the opsonic index had not been dreamed of. The use of cohesive gold in dentistry had just been introduced, and one of his first fields was the investigation of the welding property of gold. He repeated the embryological work of Magitot on the development of the tooth germ and the formation of the dental tissues. He repeated the bacteriological work of Miller, demonstrating the relation of micro-organisms to caries of the teeth. This work he pursued specially with reference to the beginnings of caries, the positions of attack; and the manner of destruction of the tissue. These studies led as a necessary consequence, to the propounding of his hypothesis of extension for prevention.

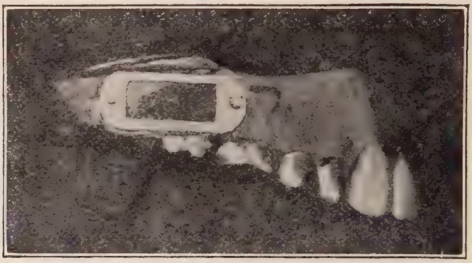

Fig. 10. A device made by Dr. Black to secure deposits of salivary calculus so that they could be transferred to the microscope for study without disturbing the deposits. It consists of a gold frame held in place with two gold screws. A specially ground microscopical cover glass is held in position by the frame, and may be removed when desired. Fresh, soft deposits may thus be obtained and stained for microscopic study.

I remember well when a student under Dr. Cushing, how he used to insist upon his statement of the philosophy of filling teeth. As he stated it, if the disintegrated tissue was removed, and perfectly replaced by an indestructible material, and the surfaces finished as smoothly as they were originally, the tooth was no more liable to decay than it was in a perfect condition. But the investigations to which we have already referred, showed that caries began only in certain areas, and if the cavity were extended, by the removal of hard tissue, so as to include these areas in the original operation, the tooth was much less liable to decay than it was originally, and the filling operation became not simply the mechanical restoration of lost tissue, but the treatment of the disease caries of the teeth.

The changes in the form of cavities made necessary by the

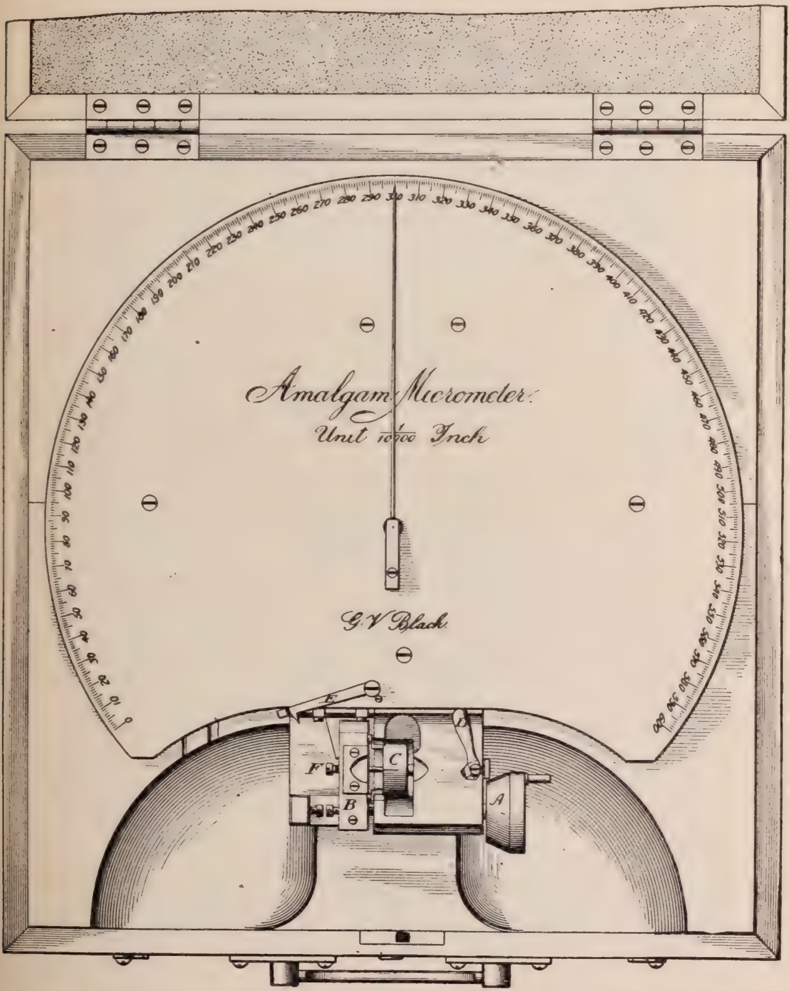

Fig. 11. Amalgam micrometer, for measuring the shrinkage and expansion of amalgams. This instrument was made by Dr. Black in his own workshop at Jacksonville, Ill., when he undertook the series of experiments which revolutionized the manufacture of amalgam alloys. The metals entering into its construction are so arranged as to eliminate errors from temperature changes. It will measure accurately shrinkage or expansion of one ten-thousandth of an inch. The fillings are made in a steel tube, C, which is so made that it can be removed and replaced in exactly the same position whenever a reading is to be made.

principle of extension for prevention led to Doctor Black's study, first, of the structure of the enamel with reference to the preparation of cavity margins; the study of the physical properties of the

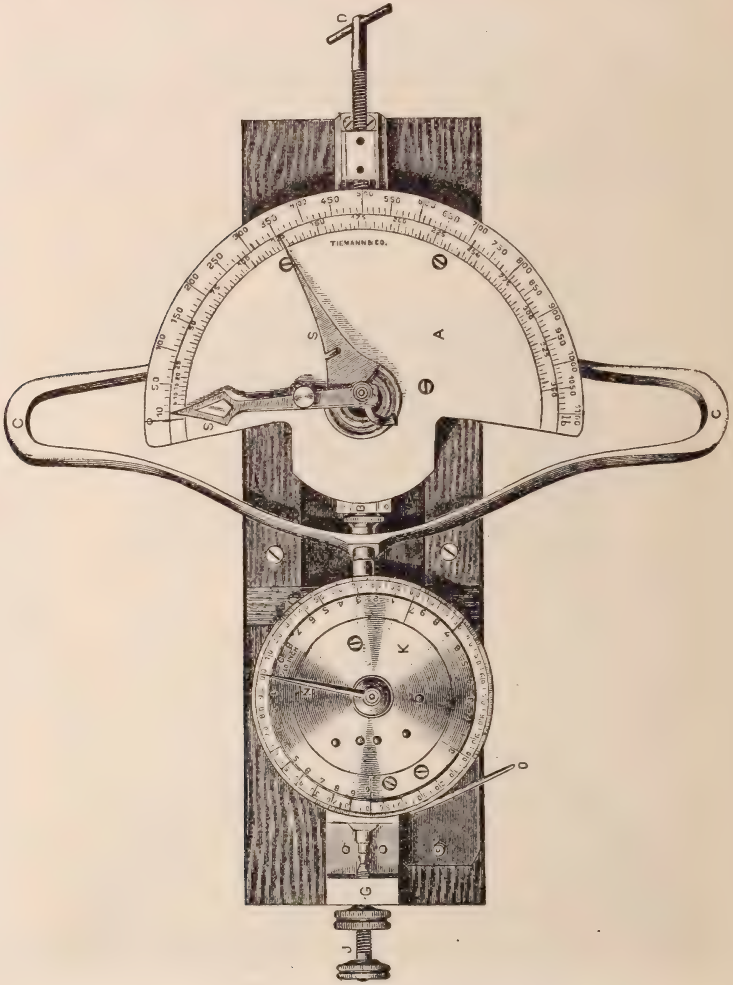

Fig. 12. Dynamometer with micrometer attachment. This instrument was originally designed and constructed by Dr. Black when he undertook his studies of the physical properties of filling materials, in the early nineties. The instrument records the compression or shortening of a substance under a given stress. For example, a filling to be tested is placed between the two points just to the right of the letter G. The hand on the small dial K will record the distance that the two points are separated. Then pressure is applied by turning the screw D. The amount of the pressure is recorded on the large dial. The compression or shortening of the filling being tested is recorded by the movement of the hand on the small dial.

dental tissues; the investigation of the physical properties of filling materials, and the manner of their insertion; the devising of instruments and methods of manipulation; the strength of the muscles of the jaws; and the force required for the mastication of foods; the last to determine the force which filling materials and cavities must be capable of withstanding in order to perform their function of mastication,—even the amount of strength required in the fingers in order to properly condense filling materials. All of these subjects

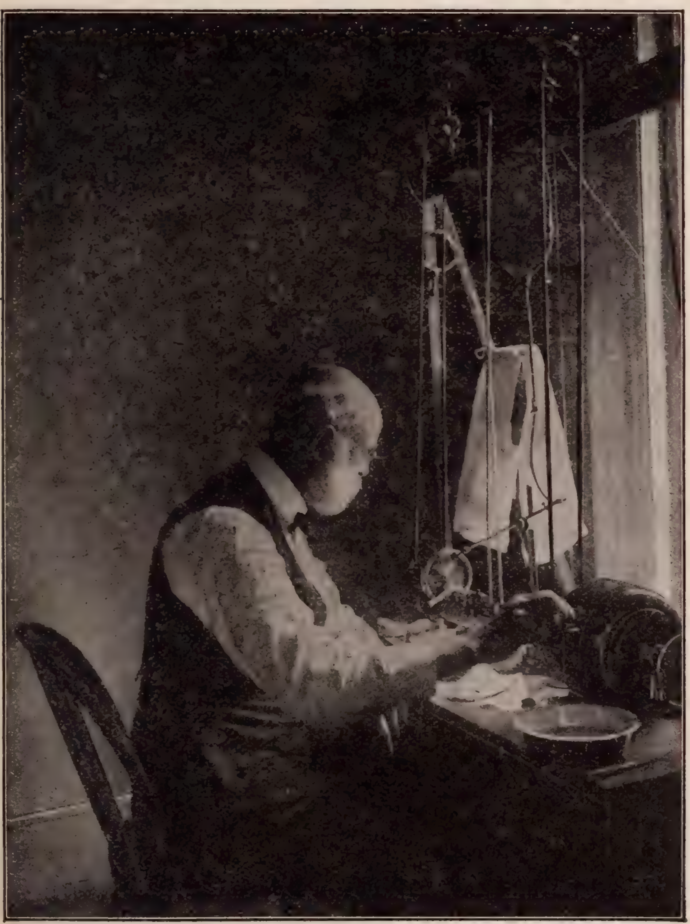

Fig. 13. Dr. Black operating the grinding machine, shown in Fig. 14.

were followed one after another in his own endeavor to make himself a better dentist and to render more satisfactory service to his clients. Altogether, they have become the greatest legacy that any scientific man in dentistry has left to humanity.

But Doctor Black's researches were not confined to the field

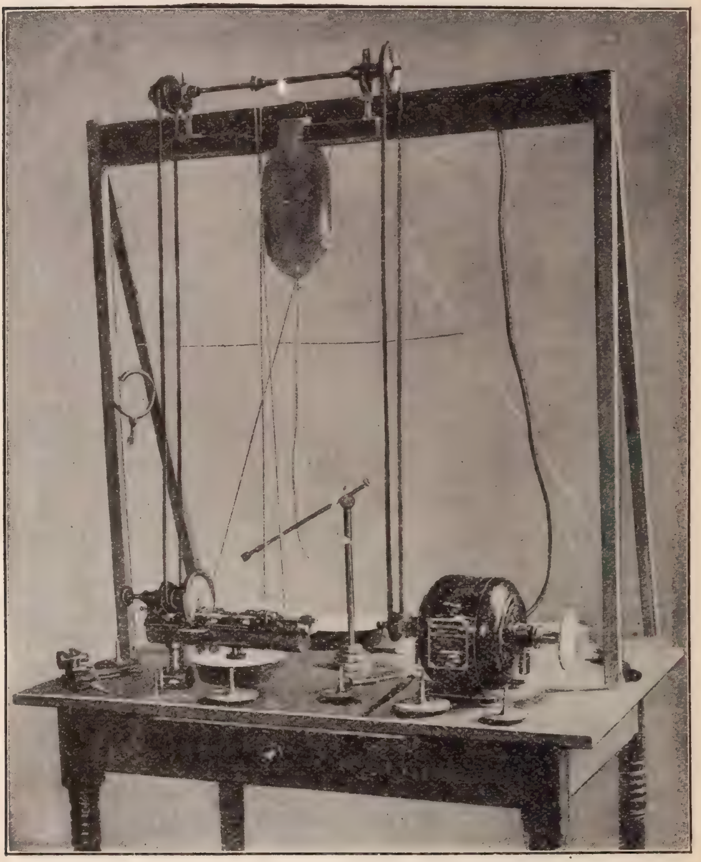

Fig. 14. A machine for grinding microscopical sections of hard substances, such as teeth, calculus, etc. This machine was designed by Dr. Black and built under his direct supervision. It is in many respects one of the most remarkable scientific instruments ever constructed. The grinding apparatus is mounted on a watchmaker's lathe. It consists, essentially, of an arrangement by which the material to be ground may be secured to a metal disk, and the micrometer adjustment set for whatever thickness—or possibly it would be better to say thinness—of specimen is desired, and the motor set in motion. When the specimen is ground to the thickness desired, an automatic electric cut-off stops the motor. It was with this machine that Dr. Black was able to grind specimens of calculus thin enough so that their structure could be made out with the microscope.

of operative dentistry. He was probably the closest student of the pathology of the soft tissues that the dental profession has had.

In 1887 Doctor Black published his book on the periosteum and peridental membrane. If the dental profession had studied this book and followed his investigations, probably much of the absurdity in the treatment of pyorrhea would never have appeared. Practically all of the writing on pathology of the dental pulp is based upon the investigations of Doctor Black which were embodied in his chapters on the "American System of Dentistry." Doctor Black's investigation of the saliva and the character and manner of formation of different forms of calculi

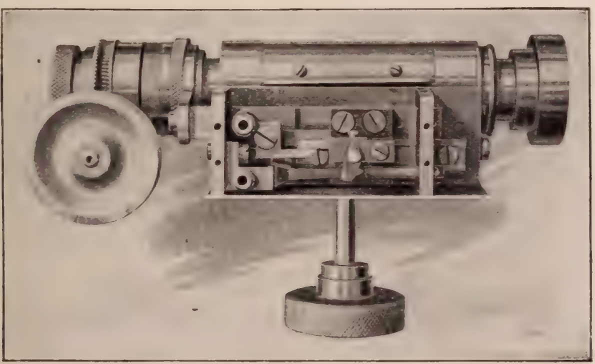

Fig. 15.

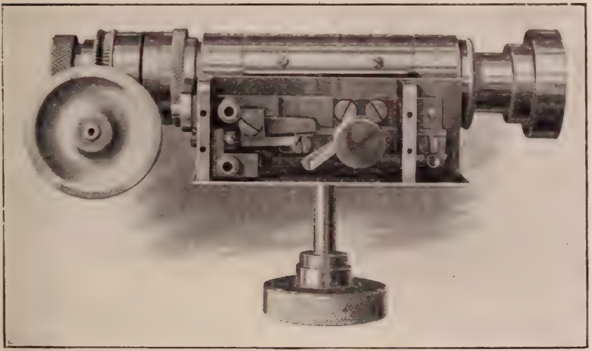

Fig. 16.

Figs. 15 and 16. The electric automatic cut-off of the grinding apparatus shown in Fig. 14. Fig. 15 shows the bars set (see center of illustration) as they are while the current is on; Fig. 16 shows one bar dropped, the current being disconnected.

will some day, I believe, form the basis for a true prophylaxis. I cannot even mention the work on antiseptics, alveolar abscess, fractures, and immunity. Every field that gave him trouble and anxiety in practice, was taken up with characteristic thoroughness, and the world left better from the results of his investigations.

As Doctor Black followed original methods in all of his lines of research, his active mind invented new forms of machinery to help him with his results. He invented and built the first cord-driven dental engine, the picture of which accompanies this article. He made the first instrument for stonecutting burs, and all of his researches were assisted by new forms of apparatus. The Doctor was a very skillful mechanic and many of the instruments were built by his own hands. I have among my cherished possessions a little instrument made entirely of brass by means of which a microscope specimen may be flattened to remove wrinkles and at the same time the surface of the cover glass left parallel with the surface of the glass, a condition which is often important in photography. The little machine is valuable to me especially because it was built by Doctor Black's own hands, and it is a beautiful showing of the nicety of his mechanical skill. The accompanying illustrations show a few of the most remarkable of the instruments which he invented.

The most wonderful thing about Doctor Black's scientific career was its simplicity. He studied to find some explanation of the things he could not understand, or some knowledge by which to improve the methods of his treatment, and when he had found a new truth he thought everyone would be as glad to hear it as he had been to find it.

> "Until the future dare forget the past
> His life shall be a lantern and a light unto eternity."

DR. G. V. BLACK, THE TEACHER AND WRITER.

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.:

In dealing with the subject of Dr. Black as a teacher it will be difficult for me to divest myself of the personal impressions I received as a student sitting under his teaching in 1884-5, when I first came to the Chicago College of Dental Surgery. Dr. Black lived in Jacksonville, Ill., at that time and came regularly to Chicago to deliver his lectures at the college.

I had been familiar with his name through the medium of our periodical literature, and naturally looked forward with much interest to seeing the man and hearing him lecture. I must here make the somewhat humiliating acknowledgment that at first he well nigh swept me off my feet with his profound and scientific treatment of his topic. The subject was micro-organisms. I said to myself: "Here is a man who knows more than he has ever put on the printed page." And this was very true at that time, because he had not yet published a book. But I soon found that it was only necessary to be an observant student in order to follow him perfectly, because no man was better qualified than Dr. Black to make an intricate subject clear to the listener.

In those days he wrote his lectures and for the most part read them to the class. This insured that every word counted, and it was no small task to take notes of his lectures, and be sure of all the important points. In fact I am not certain that he did himself full justice as a teacher by this method, though it was undoubtedly done through the conscientious conviction that it was the only way in which he could condense his subject into the limits of a college course. But the rarest moments of those wonderful days came as the result of a frequent diversion from the written page when either in answer to a question from a student, or on an impulse as a significant idea struck him he would drop his manuscript and launch out like a free lance into the highways and byways of his subject, giving himself full rein. It was then that the spontaneity and profoundness of his knowledge became most apparent. I have never known a man who was so well-informed along so many lines as he, or who could so perfectly impart his information to others. He was naturally a teacher, whether in the capacity of a lecturer before a class of students, or in a companionable way sitting with his after-dinner cigar talking to an audience of one. It has been my cherished privilege to listen to him under each of these environments, and while the memory of those early days in college must ever remain with me most vivid and enduring, yet I am frank to acknowledge that the greatest measure of service he ever rendered to me as a teacher was in those rare evenings as we sat together discussing freely and fully the various dental problems of the day. It was in this capacity that he taught me more than I have ever learned from any other source, and when the sum total of the knowledge he thus spread among his friends is estimated it will be found that it was no mean factor in the great good he did.

And this brings to mind a very prominent characteristic of Dr. Black as a teacher. He was approachable at all times, and no student or practitioner ever appealed to him in vain. He was never "too busy" to see the humblest seeker after knowledge, and as I look back over it now I am fearful that many of us unwittingly imposed on his generosity of heart throughout his life. But with it all he remained sweet in his disposition; and he remained approachable to the end. This is an indication of a great man.

There was always to me something striking about Dr. Black's appearance before a class or a body of practitioners. He was typically a scientist with the scientist's keenness of analysis in approaching any subject. Those of us who had the good fortune to hear him speak frequently will recall that he had his own individual way of handling every topic, and his own manner of stating his theories. He seldom wasted a word, and every word meant something.

I may, I think, in this connection be pardoned for diverting slightly from the main topic assigned to me to refer briefly to his classic work or nomenclature. At the World's Columbian Dental Congress he was appointed to report on Dental Nomenclature, and it is safe to say that never in the history of the profession was so much of significance affecting the phraseology of dentistry crowded into a single document as was contained in this report. It required some courage and a very great deal of study to rearrange, eliminate, add to, and systematize the current terms of the profession, but when he was through with it our nomenclature was more striking, exact, and intelligible than it had ever been before. And I have thought that it was this study which enabled him more readily than most men to select the proper word in expressing himself on the platform or in the printed page.

To go into detail at this time regarding the writings of Dr.

Black would carry me beyond the limit of time at my disposal, and fortunately for you and me this is not necessary. At the banquet tendered him in 1910, a list of his writings up to that date was compiled, by Dr. Arthur D. Black, and published in the March number of the DENTAL REVIEW. To merely glance over this list is bewildering. It contains almost every known subject from stories of adventure (many of which I have heard from his own lips) to the most profound scientific dissertation. In one place it was "The Study of the Cicada" (Seven Year Locusts), in another "The Pathology of Scarlet Fever." In 1866 we find him writing on such topics as "Oxygen," "Flame," etc. In 1867 "On the Treatment of Nearly Exposed Pulps," (note that he did not say "nerves" even back in 1867,) and on "Epithelioma." His paper on "Gold Foil" read before the Illinois State Dental Society in 1869 was classical in its perfection. Nothing has ever been written since to disprove a single statement made in this paper, or to add an important item to it. In this year he also wrote a paper on "A New Method of Grafting Crowns on the Roots of Teeth." Some of his subjects back in those early days makes one reflect on the adage that "History repeats itself." For instance in 1874 we find him writing on "Popular Education with regard to the Subject of Dentistry," and "What are the Best Materials for Filling Roots of Teeth?," while in 1876 he writes on "Pathological Conditions of the Teeth and their effect upon the General System." One marvels at the height and depth of this man's mind. To me, impressed as I am by his great variety of topics on dentistry, he is even more attractive when he goes outside the profession and deals with other things. In 1875 he wrote one paper on "Typhoid Fever" of forty-six pages, and another on "The Earth Worm" of 73 pages. Then before the Literary Union of Jacksonville he read a paper of 36 pages on the comprehensive subject of "Man—Representative of the Universe." I have had the pleasure of reading this paper in manuscript, and it is one of the most profound and philosophical studies I have ever perused. Later we find such subjects as "Wind and Storm," "Progress of Civilization," "The Practical Relations of Observation to Thought," "The City Waterworks," "Waste Products of Thought," and "The Balance of Reason."

Then we find him dealing with sociological questions in such papers as "Influence of the Middle Man in the Formation of Social Castes in America," "The Industrial Picture," "Our Police System," and "Manual Training as an Element in Education."

In his more playful moods he touched on topics such as "Out Sailing," "The Man Eater"—a story, "From Quebec up the Saguenay and Chicoutimi," "Sam Marsden's Race for Life," an Indian Story, "New Orleans," etc. Then came the time when we find fewer of these diverting titles, when the absorption in purely dental topics became more pronounced, and the array of subjects connected with dentistry is profoundly impressive. From this time on there is no keeping pace, by ordinary mortals, with his variety of subjects or the masterly manner in which he presents them. To familiarize one's self with the bibliography of this one man is to have gone far toward securing a liberal dental education and the world of dentistry is made richer by the heritage of literature he thus left behind.

To my mind the most significant of his writings on dental subjects are his paper on "Gold Foil" (previously alluded to), "The Management of Enamel Margins" in 1891, "An Investigation of the Physical Characters of the Human Teeth in Relation to Their Diseases and to the Practical Dental Operations, Together With the Physical Characters of Filling Materials," in 1895, his various papers on the preparation of cavities, and on the contact point and interproximal space; and his published books such as "The Formation of Poisons by Micro-Organisms," "A Study of Histological Characters of the Periosteum and Peridental Membrane," "Descriptive Anatomy of the Human Teeth," "A Work on Operative Dentistry in Two Volumes," and his last book "Special Dental Pathology." This recent work seemed to be the culmination of a long and marvelously productive literary career, a rounding out as it were of his cycle of subjects. It would have been a distinct loss to the profession had this work not appeared, in view of the Author's profound knowledge of the subject; because learned as he was on all the other branches of dentistry I have always felt that his really greatest distinction lay along pathological lines.

In one sense therefore we may say that his work was finished, and that it is well. True, it is hard for those of us who were wont to sit at his feet to yield him up. And yet we have the printed record, the priceless treasure house of his mind laid open for our service. We have his words for our guidance, and his deeds for our example. We have the blessed memory of what he was and what he did; and having this we gain a consolation for our hearts, and a consecration for our minds. In all the realms of human kind no man ever more perfectly filled his particular niche in the world than did Dr. Black. The most we can do is to try to follow where he led, and to profit daily by the lifelong example he set.

In February, 1905, I had the honor of reading a paper before the G. V. Black Club of St. Paul on "My Indebtedness to the Teachings of Dr. G. V. Black," and with your kind permission I should like to terminate my present effort with the closing paragraph of that paper.

"In the history of nations, in the record of events, in the evolution of great movements, in the fruition of reforms, certain names must ever stand out as representing conspicuous forces in the progress of the world; and when the history of dentistry shall have been written, however far in the future the record be made, no name will shine with greater luster in all the galaxy of noble men who have gone before than that of Greene Vardiman Black."

DR. BLACK, MAN AND FRIEND.

BY THOMAS L. GILMER, M. D., D. D. S., SC. D., CHICAGO, ILL.

It is with reluctance, because I feel that I cannot do him justice, that I attempt to speak to you tonight of that great and good man, your friend and mine, Dr. Greene Vardiman Black. My association with him extended over a period of forty odd years, and in all that time no word of discord ever passed between us. As I look back over the years I recall with affectionate recollection his genial greeting, his warm handshake and the welcome twinkle in his eyes, upon the occasions of my visits to him. Doubtless all who knew him well will remember these characteristics of his nature.

When I first became acquainted with him I was young, just entering on the practice of my profession, and was much in need of a wise and experienced friend who was able and willing to advise me. That friend I found in Dr. Black. He at once took a kindly interest in me, and on through all the years until his demise, he was always the same patient, earnest teacher and friend, helping me in my difficulties and rejoicing in my successes, and I gratefully testify that whatever of merit I may have achieved professionally, I owe largely to his influence. I am not alone in this. There are many who could testify to inspiration received from his knowledge and his advice. Indeed, Dr. Black was ever ready to give considerate attention to any who showed a live interest in almost any line of human activity.

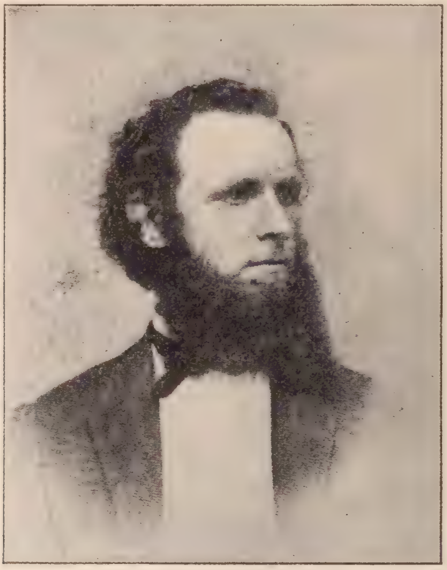

Fig. 1. Photograph of Dr. Black taken about 1865.

He had an insatiable desire for knowledge, he was a good listener, was open-minded, and seemed able to extract something of value from almost all with whom he came in contact. He could adapt himself to all classes of men, be they fishermen, logmen, or men of letters and refinement. Whether college or nature bred, if they had facts of practical value to present, they were sure to evoke his lively interest. He was a voluminous reader, he observed accurately, and he was a profound thinker.

It may truly be said of him that his was a diversified mind, richly stored with knowledge of a multitude of subjects.

A question that naturally arises in one's mind is, what was the secret of Dr. Black's ability to accomplish the prodigious amount of work he is known to have accomplished? In answer it might be said it was attributable largely to his energy and perseverance, and to his habit of thoroughness. He did nothing haphazard, no minor detail was too small to be lost sight of. Before commencing a work, he had already blocked out mentally the details of procedure, and he followed these in their natural sequence, dovetailing the facts as he advanced so that when the structure was finished it was a complete whole. On account of his accurate methods he rarely had to retrace his steps. He was a man of plain words, this was observable in all his writings and discussions.

Fig. 2. Dr. Black trout fishing in Carp River, Northern Michigan.

Dr. Black was a great lover of nature. This love was so strong it was almost a religion. He never tired of its contemplation. John Muir was one of his favorite authors, and like Muir he was fond of visiting localities where man had despoiled nature least. He delighted in speculation as to the causes of this or that gigantic force which had convulsed nature and brought about the wonderful transformations seen in our more rugged and mountainous regions. Several of the illustrations are reproductions of photographs taken at various outings. The one of Dr. Black in Cheyenne Canon, Colorado, is characteristic of the man as he stands by and rests his hand on one of his tree friends; it is typical of the attitude of the man when viewing God's great works.

Dr. Black spent several vacation seasons in northern Michigan, where he sailed and fished by day and slept in his boat by night. Here he studied the geological formations, the flora and fauna of the region, and at the same time cultivated the fishermen of the lakes and the woodsmen of the forest.

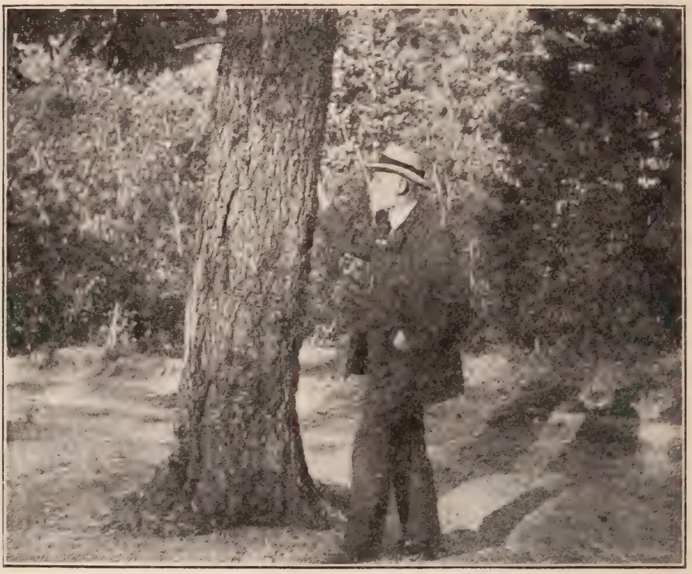

Fig. 3. Dr. Black in the woods on Cheyenne Mountain, Colorado, west of Colorado Springs, July, 1910.

Dr. Black visited me frequently when I resided in Quincy, Illinois. Once he spent a whole day with me on the Mississippi in a sail boat. This to him was a new experience and it charmed him. During the day he proved himself an apt scholar in matters nautical, and by night he had learned to manage the boat and its sails remarkably well. On visiting him some weeks later he surprised me by exhibiting for my criticism the drawings and working plans of a complete sail boat, adapted to his needs, both as a pleasure craft and as a shelter by night, to be used on his

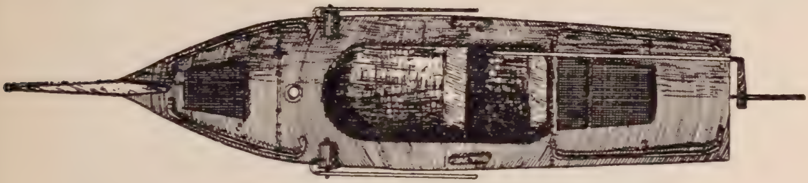

Fig. 4. Pen drawing by Dr. Black of one of his sailboats, the "Microbe." This boat was built to Dr. Black's design for two persons for cruising. It was 18 feet long and 4 feet 6 inches beam, sloop rigged, and had starboard and port leeboards instead of a centerboard. This permitted the use of the cockpit as a bunk. There were watertight compartments fore and aft. The forward compartment was used for the storage of provisions, the aft compartment for clothing. There was also just back of the cockpit a small metal-lined well, covered by a separate hatch, containing two oil stoves. Several boards were placed across the bottom of the cockpit to support the bedding. These boards were of the proper length to deck over the cockpit, and when so placed were covered by a special oiled canvas, which made the entire boat watertight and practically unsinkable in any sea. Two of these boards were also equipped with folding legs and an arrangement for fastening them together to make a table for use on shore. Two folding camp chairs, a tent and much other equipment was carried. Dr. Black kept his boat at Petoskey, Mich., from which point he sailed the waters of northern Michigan, Huron and the Straits for fifteen summers, from 1877 to 1891.

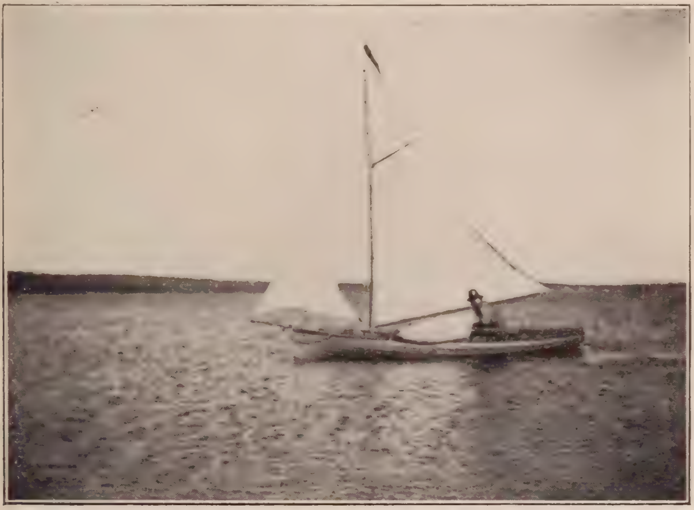

Fig. 5. Dr. Black in his sailboat near Mackinac Island.

vacations in the upper Michigan region. He used this boat for a number of seasons, and proved its value as to seaworthiness and otherwise on many occasions.

Dr. Black was a good story teller and would entertain his friends by the hour in relating incidents of these outings. He was not without humor. He used to tell a joke on himself which was the result of a conversation with an old Indian fisherman of those northern parts. He was interested in this Indian and one day in their conversation asked the grizzled old man his age. "Oh, 'bout seventy," he said, "How old you?" Dr. Black asked the old Indian, "How old do you think I am?" The Doctor's hat was off at the time, exposing his bald head. The Indian looked him over a moment, then said, "Hair all gone, 'bout a hundred." He often related this story with much gusto.

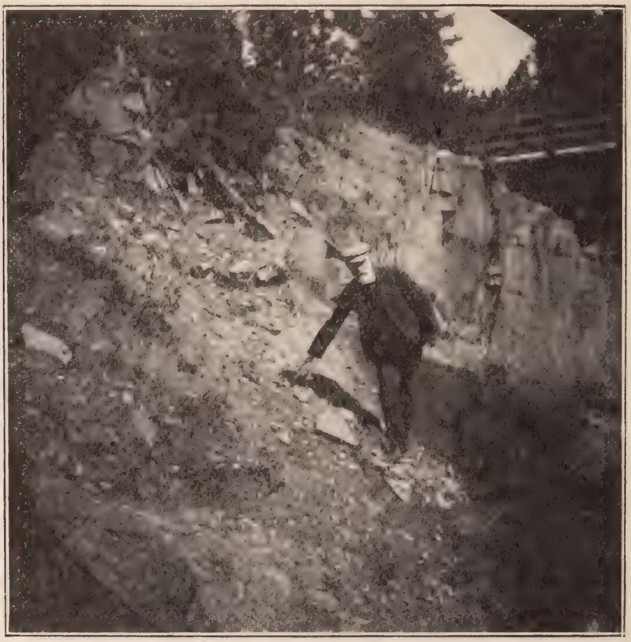

Fig. 6. Dr. Black out "exploring" among the rocks about Duluth.

Dr. Black had a wonderful faculty for drawing. Once, when visiting him in Jacksonville, thirty odd years ago, I found him writing the specifications for a business house, the architectural and working drawings having been made in every detail by himself. That building still stands on the south side of the public square in Jacksonville, and is in keeping architecturally with others more modern.

Dr. Black was artistic; he made beautiful drawings and sketched well. The accompanying picture from a pen and ink sketch by him of Dr. Prince, his close friend and co-laborer, the great surgeon of central Illinois thirty years ago, is indicative of his artistic ability. In this connection it may not be amiss to relate a personal incident. Dr. Black knew of my interest in oral surgery and did what he could to encourage my study in this line. I had had in my earlier practice a number of mandible fractures for treatment. He said to me, "You must write a paper on jaw fractures for the Illinois State Dental Society." I expressed a reluctance to undertake such a task, and said, "Unless a paper of this kind is illustrated it will not be a success." His answer to this was, "You write the paper and I will illustrate it." I

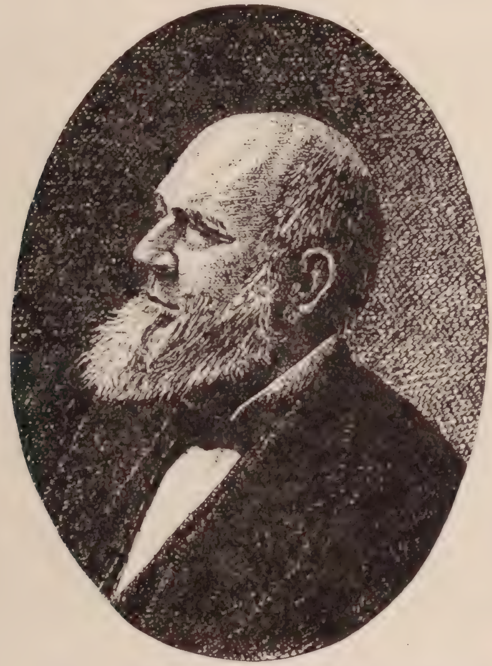

Fig. 7. Pen portrait of Dr. David Prince, of Jacksonville, Illinois, made by Dr. Black. Dr. Prince was one of the most prominent surgeons of central Illinois from 1860 to 1892, and was a very close friend of Dr. Black.

finally concluded to comply with his suggestion and wrote the paper. I took it to him and we went over it and agreed upon the illustrations. Some weeks latetr he wrote me that the pictures were ready and invited me to spend Saturday night and Sunday with him, that I might see the result of this labor of love. You can imagine my surprise when he exhibited for my criticism forty beautiful life-sized water colors illustrating every phase of the paper. I largely attribute the success of the paper to Dr. Black's illustrations. No set of illustrations of this nature before or since, were or have been comparable with these. The paper and illustrations were copied in Germany, Italy and Spain, which was additional testimony of his marked ability as an illustrator.

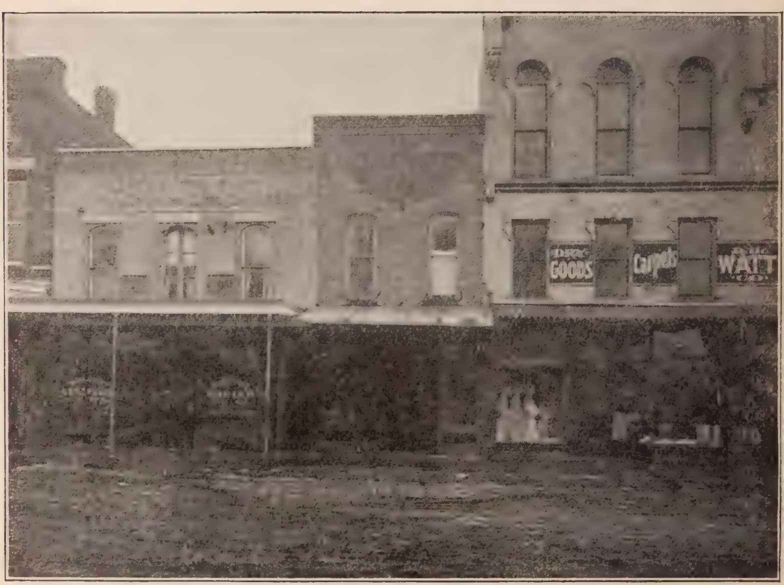

Fig. 8. Dr. Black's office in Winchester was in the back part of the building in the center of the picture which has the sign "City Drug Store" on it. This was Dr. Black's first office after beginning the practice of dentistry for himself in 1858.

Dr. Black once told me of an incident in his life which left a deep impression on him. This is the story as he relates it. "I was seated in my study one summer day, the door was open, I was conscious, though I did not see aynone enter, that some one had entered the room. I turned around and there stood before me a distinguished-appearing, elderly man. He may have been a great physician, or what not; I do not know." He said, "Are you Dr. Black?" I answered, "Yes." "Are you *the* Dr. Black?" I replied, "I am Dr. Black." "Are you the Dr. Black who wrote "Formation of Poisons by Microorganisms?" I replied, "I am." "Well," the stranger said, "I have come much out of my way to shake your hand, and to congratulate you on having produced the greatest book of the kind on this subject." "The man immediately turned about, left the office without another word. I never knew who this stranger was."

I once had an amusing experience in connection with Dr. Black and his brother, who was a prominent physician living in Clayton, Illinois. This brother was something of a politician. He was visiting Quincy, Illinois, my home at that time, attending a political meeting. I met him and he said, "You know my brother, G. V., I believe." I replied, "I do." "Well," he said, "if G. V. would let investigations alone and attend to his legitimate practice, he might amount to something." I went down to Jacksonville a short time after this and told Dr. Black that I

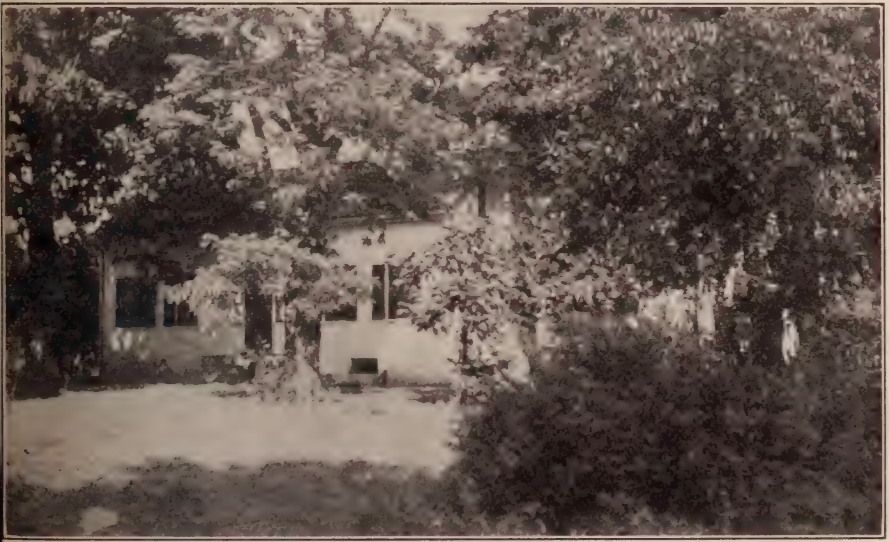

Fig. 9. Old home where the Black family lived after 1844. The house was built by William Black and his sons, among them G. V. Black. The clay was dug, the bricks made and burned near the house, and the lumber was sawed out of trees from the timber near the edge of which the house was built. It is still in a perfect state of preservation. The picture shows the west front. The farm was purchased by Dr. G. V. Black about ten years ago.

had met his brother at Quincy. He said, "I suppose he was on some political business?" I replied, "Yes, he was attending a political convention." Dr. Black then said, "Well, if my brother would let politics alone and attend to his legitimate practice, he might amount to something."

Dr. Black's eminence as a scientist is known the world over. Perhaps a few words as to the domestic side of his life, possibly not so well known, may not be amiss. At times, when I was fortunate enough to be the recipient of his generous hospitality, we would spend most of the day in that part of his house devoted to his scientific pursuits. When the principal meal of the day was announced and we were seated with his wife and children about the dining table, Dr. Black would bow his head and reverently return thanks to his Heavenly Father for his mercy and blessings. This was his universal custom. The conversation would then become general, science for the time, being eschewed. After the meal we would repair to the living room. Dr. Black was fond of music and would ask his gifted eldest daughter to accompany him on the piano, when he would sing certain old songs of which he was very fond, among them "The Larboard Watch," "I Stood on the Bridge at Midnight," "Swanee River," "Annie Laurie" and others, and then he would get out his cello, on which he was at least a creditable performer.

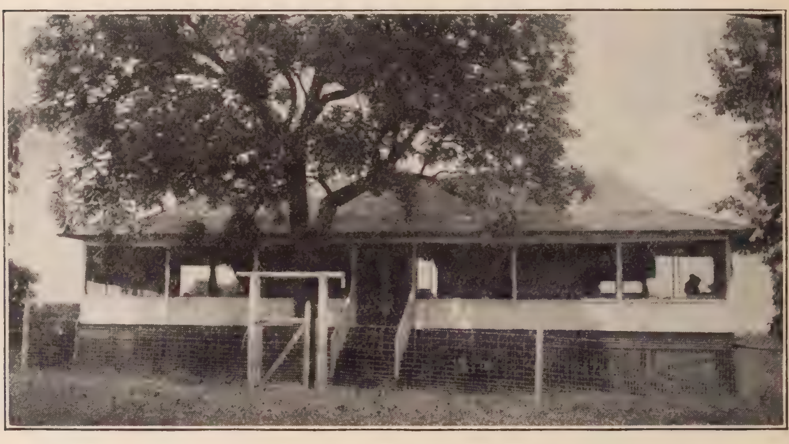

Fig. 10. "Walnut Lodge," summer cottage on Dr. Black's farm. It was in this bungalow that Dr. Black died.

I would like in addition to this to pay my tribute of honor to his devoted companion, Mrs. Black. She it was who ever made the way smooth for her husband to give his undivided attention to the work he had in hand.

It seems fitting on this occasion to recall certain memorable words spoken by Dr. Black at the dinner given in his honor by this Society five years ago. He said, "I want to say to you one and all, who have come here tonight, and those who have not come, that I thank you from the bottom of my heart for what you have said and done, not only the speakers of the evening, but those who have not spoken. I have heard from most of you. I know you. As to these beautiful things that have been presented here tonight—what would I say? Beautiful and valuable as they are, the most beautiful thing, and that which I shall value most, is that which has prompted the giving. Again I thank you.

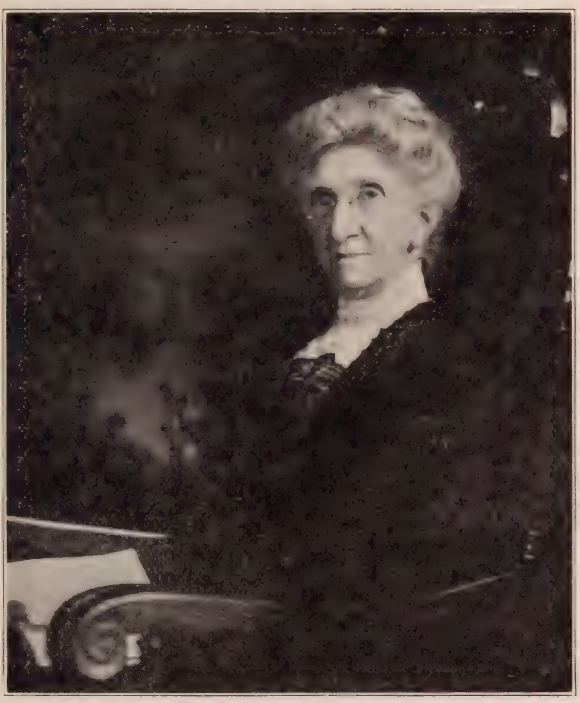

Fig. 11. Mrs. G. V. Black.

There is one thing that I miss, and that is my older associates who are gone; they are not here tonight, in the body at least. I would wish they were. Now, with this, I will say goodbye—no, good night, not good-bye, because I expect to see many of you again. And another thing I had intended to say, and I will try to say it, is that I am not ready to say good-bye. There are many things in my mind today that ought to be done, that possibly I may be able to do, and for that reason I am not ready to say good-bye. And still another reason: I love the dental profession; I love the work I have been doing, and I am not ready to quit."

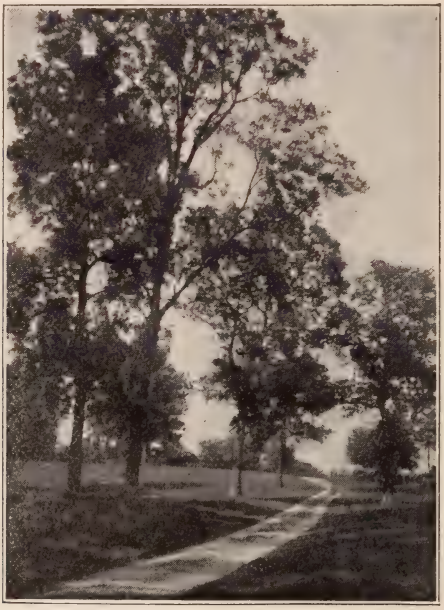

Fig. 12. A recent photograph of the roadway through the walnut grove on the Black farm. This grove of about forty acres was planted by Dr. Black's father. Dr. Black spent several weeks each summer in recent years directing the work of trimming these trees, which are to be classed among the finest black walnut trees in central Illinois.

Reference has been made to Dr. Black's love of nature. During the last years of his life he spent much time among his own loved trees on his beautiful farm in Cass County, Illinois. He took great pleasure in caring for them and directed their pruning.

When I was called to visit him in his last illness I made pictures of some of these trees and his lodge and other houses. The slides now shown give you some idea of the beauties of his country home. It was among his loved trees that our dear friend departed from his life of ceaseless labors.

ST. LOUIS DENTAL SOCIETY, OCTOBER 12, 1915.

DISCUSSION OF THE PAPER BY DR. CLARENCE O. SIMPSON ON "WHAT IS THE MATTER WITH DENTISTRY IN ST. LOUIS?"

DR. WILLIAM CONRAD:

Before entering upon the discussion of this very literate, and very elegantly read paper, I would like to express my thanks to Dr. Simpson and to express my astonishment that any man was able to write a paper of this character in the short time I know he has been in writing it.

"What is the matter with dentistry in St. Louis?" is asked by Dr. Clarence O. Simpson, one of the most distinguished members of the St. Louis Dental Society. How about that? O Lord, my God, is there any help for the dentist in distress? Dr. Simpson's paper is up to the members of the St. Louis Dental Society and I hope they will consider it in a manner to remedy the evil, if there is anything wrong with the dental profession in St. Louis. Individually, I do not think there is anything wrong. I think it is the tip-top, blue blossom of dentistry, no matter where practiced. (Applause.)

But for fear there is something wrong, let us discuss this paper Dr. Simpson hands to us with so much confidence, with due respect for his international reputation, he having within the last few weeks read a paper before the Panama Pacific Dental Congress which was of such interest to the dental profession and the people in general that the newspapers of San Francisco considered the subject matter of Dr. Simpson's paper of such public value that they published it and gave it to the Associated Press in order that it might go before the people of the world. I received from Dr. Simpson a copy of part of his paper on Saturday. He certainly is a "peach" for quick writing, and it is a *good* copy, he must have been a newspaper writer, as many another good dentist has been. But what are such clodhoppers as myself and others to do when we have to discuss his paper tonight? Yesterday I received the second part of his paper. Good Lord, I am in for it good and plenty. I thought I had all I wanted to handle in the first section. (Laughter.)

I want to thank the Society and the President for asking me to take part in this discussion. Perhaps it was because I have been an active member longer than any present and should have some common sense. My rule in life has been never to tell how little I knew, and make believe I knew a lot of things I never tell. For 25 years I was regarded as a dental boss in the "Dental Trust," often referred to as the "Dental Boss" in print. Look at me now, no dental boss of a dental trust but bossed about by dear friends who are the dental bosses of today. I like it and it is as it should be. After a long and busy professional life, to have the love and affection of the new order of dentists is something to appreciate, which I most certainly do, especially for the sake of the new boss at 3666 Olive Street. I take pride in the work done by St. Louis dentists and could name them all with an account of their most conspicuous achievements. There are three men alive today whom I wish were with us tonight. Dr. Prosser, Dr. Newby and Dr. Bowman.

Writing is hard work for us less gifted than Dr. Simpson with his gift of gab. (Laughter.) I do not like the title of the Doctor's paper, although I agree with the subject matter of most of it. What is the use of giving dentistry a black eye just at the outset of his paper in this title? The Doctor certainly gives enough evidence to prove that something is the matter with dentistry in St. Louis; however, the same evidence will apply to and prove that something is the matter with dentistry in every other place as well as in St. Louis. (Applause.) He refers to the earlier history in the list of those who helped to make dentistry, which only shows, if we take the trouble to look up the history, that the conditions of today have always existed in some form at some time in the history of our profession. I just refer you to the first number of the *Missouri Dental Journal*. In it are the names of the men and the articles which made St.

Louis dentistry famous. I have it marked and would like to read them, but it is too late. Simpson was too long reading his good paper, only *45 minutes.* I will be about 60 reading mine, so if any of you want to go home understand I shall not be offended.

I have called your attention to the contents of this volume of the *Missouri Dental Journal.* These same men were largely instrumental in forming the Ohio, Illinois and Missouri State Dental Associations, also in forming the Missouri Dental College and the *Missouri Dental Journal.* All of these men were active in the affairs of the St. Louis Dental Society, and if you will follow their history as it appears in the pages of this journal, in the transactions you will find their ups and downs were about the same as we have them today. Black, Eames, McKellops, and the others mentioned by the Doctor were prominent men and they had their disagreeable times, they had their low fees and their lack of appreciation, apparently; but as we look back upon them we think they were great giants and they were, but in those days they were giants because the societies were small, they were all workers and not lost in the crowd. Every one of them was a writer, a speaker, and a worker. Why should the St. Louis Dental Society have so completely lost the talent of writing, of speaking, and working, that we have for three years had to hear most of the talent who presented the subjects for discussion before this society, from outside? There has not been one man who appeared here during the last three years, of this foreign talent, but that some member of the society could have written a better paper if he had tried. "Scintillating dignitaries," don't you know; that is what Simpson calls these fellows you have been hiring to read papers. Confounded good name, too. (Laughter.)

I ought to move along, but by golly I am going through with this thing whether you like it or not. He refers to the expression, "I do not know the gentleman, never heard of him." Now do you know I think that is a good answer, a right good answer. I have even made that answer myself. Then he goes to work and refers to home-grown casting machines. What is the difference? If we can make a good inlay with a home-grown casting machine, what is the use of buying an expensive one? This painless dentistry; the two things which attracted the most attention at San Francisco were pyorrhea, with all the variations of emetin thrown in, and the attempts to produce painless dentistry. The profession is crazed about trying to produce painless dentistry. It is not a question of good dentistry, but they want to get all this paraphernalia distributed about the office to have the greatest effect, and to have all the friends who come with the patients circulate the report that our worthy doctor is an up-to-date man, has so much in his office for the purpose of making dentistry painless. I ran into a nest of those fellows in the West who had their offices filled with this apparatus and I told them the sad experience of an expert dentist in one of their cities, in killing one of the wealthiest and most prominent young ladies in the city. Partial consciousness, you know, is often dangerous, and he certainly killed her good and plenty. (Laughter.) These fellows had heard nothing about it, because the dentists of that city were sufficiently loyal to their unfortunate brother to keep the news from being widely circulated. (Applause.)

Dr. John H. Kennerly:

I would like to reiterate the remarks made by the other gentlemen, that the paper was received only last evening and it was difficult to prepare a discussion. However, while I do not agree by any means with Dr. Simpson's paper, I agree with the idea or thought which originated the paper. As I read between the lines, the intention of Dr. Simpson was to bring about some change or changes which would be of benefit to the profession, and he has taken this means of doing it. I am one who would naturally be supposed to take up the defense of the colleges which he criticises. I do not propose to do it, because I would have to criticise myself too much; but I do want to ask Dr. Simpson to look back to the days of '99, when he matriculated in a dental school in Chicago, and see whether they did not make a rattling good dentist out of a mighty poor porch-climber. His idea of determining in three days whether the student should be dismissed from the institution is just a little bit too much of the 20th century speed, which most of the dentists are being criticised for by Dr. Simpson tonight.

It is strange, but the minds of old men apparently run in the same channel. I am not referring to Simpson now, but to Conrad. Conrad brought with him the first number of the *Missouri Dental Journal,* which is a little more than a quarter of a century old. When I read Simpson's paper over for the second time this morning it occurred to me that I had noticed, in my nosing around the library, where somebody else, sometime or other, made just such a spiel as Simpson was going to put up tonight. I thought it was incumbent upon me to see if I could locate it. I located it all right and instead of the *Missouri Dental Journal,* the first journal published in the City of St. Louis, I located it in the first dental journal ever published in the United States, just a little bit more than three-quarters of a century ago. It was the same cry about poor dentistry as now.

Now a word in reference to the men particularly named as previously being the bright lights in St. Louis. You never see Conrad's name mentioned in that list and he has been here longer than any other man, with possibly one exception. But why are these men mentioned, or I should say why are they always mentioned as the particular shining lights of the profession in this city. My idea is this, gentlemen, the number of dentists in St. Louis at the time these men shone so brilliantly was so small in comparison to the present number of dentists that they had the whole thing their own way. There was no other sun to shine. These men, few in number, were experts, we do not deny that for a second because the older men who are here tonight possibly know of their ability, but I am going to say, as I stand here after having known them and associated with the profession for more than twenty-five years, that we now have men in practice in the City of St. Louis who could work rings around them. (Applause.) Yes, that is true, the trouble is we have a mass of men and the greater number are like our mistakes. Our mistakes do not come back to us; the other fellow gets them. That is the reason we see all this poor dentistry, and I want to claim right here, dentistry in St. Louis today is as good as it ever was. Now, I am going to read to you for a few minutes some extracts from the first number of the *American Journal of Dental Science,* published in 1839. (Reads.) See Vol. 1, No. 2.

Dr. Otto J. Fruth:

I was less fortunate than Dr. Conrad in that I received a copy of the paper only last night, and did not have an opportunity to look at it until this afternoon. To discuss this paper intelligently requires some time, and as it was impossible for me to prepare a written discussion I shall take the paragraphs in order and ask you to overlook my shortcomings.

I cannot agree with the essayist in every respect, but many of his statements are true. He speaks of the men who have passed away many years ago, men like Forbes, Eames, Morrison and Black, some of whom I have had the pleasure of knowing. It was my good fortune to have Dr. Morrison as my preceptor, and I feel I was inspired by his ideals and work.

Dr. Simpson criticised us for being lazy or over-modest and I feel many of us have been so. It is quite a task for me to write a paper, so I do my best in presenting clinics and have profited greatly from it. Preparing papers or clinics, and attending dental meetings consumes much time and money, which is a consideration to many. These factors have limited research work and for this purpose the Research Foundation Fund was started, to eliminate these individual sacrifices.

Dr. Simpson calls attention to the few local men appearing on the programs of the National meetings. All of us who attend these meetings know they are largely political and executive, and while there are some good clinics, you will usually see better at any state meeting. I have not favored having outside talent here for nearly every meeting as we have had in the past, and I agree with Dr. Conrad that we have members in this society who are able to prepare papers as good or better than some to which we have listened. In order to satisfy Dr. Simpson, it would be better hereafter for the members of this society to provide the papers. The reason so many dentists are brought before the spotlight in other cities is because of the "mutual admiration" societies which exist there, where you find each one boosting the other.

The present standard of dentistry, I believe, is poorer than that of years ago because of the many so-called easy methods which have been advanced and which the majority of dentists are quick to grasp. There is no doubt that the casting process, silicate cements, fibre golds, and such, while practical and useful when properly handled, have been abused by many and are partly the cause of the poor results seen every day.

Analgesia is a dead issue with the majority of the men who attempted to use it, which bears out my opinion of it from the beginning. The subject of radiography is an interesting one, and as Dr. Simpson says, no appliance has been installed in our offices. One reason is because of the expense incurred, another is the lack of time in a busy dentist's life for the making of the proper radiographs. Making a radiograph of each operation would be an ideal way of practicing dentistry, but we know that is impracticable on account of the cost to the patient when most people object to the fees now charged.

Prophylaxis or preventive dentistry has been taken up by a great many, and usually turned over to an assistant or office girl. It is difficult to understand why people will submit to this, but it is no doubt because they know the fee will be comparatively small when the assistant does the work.

In regard to laboratory work, the very fact so many laboratories exist in St. Louis shows a great deal of work is sent to them, and if one only looks into these laboratories and sees the wire measurements and wax impressions they receive, it is not surprising that such poor dentistry is exhibited in the mouths of patients. Of course the fee often regulates the service and it is unfortunate, since we know the man who puts on five dollar crowns usually does not give more than five dollars' worth of service, and in most cases is robbing the public when he charges that. The same is true of amalgam fillings, when one charges a "quarter," seventy-five cents, or a dollar, you can readily see he cannot do much more than "wipe a joint." (Laughter.)

I cannot quite agree with the essayist regarding the support of the specialists by the profession. I think the orthodontists receive very good support from the general practitioner, most of them are prosperous and they must depend largely upon the profession for the work sent them. In general practice if each of us sent our cases to the specialist there would be little for us to do; we would send one to the orthodontist, another to the pyorrhea specialist, then would come the exodontist, the prophylactic specialist, and the prosthetic man. Now what is left for the general practitioner? (Dr. Simpson: Specialize.)

Dentists do more harm than anything else when they boast of the number of patients they treat each day and the amount of money made in a year. This creates dissatisfaction among the laity, they will say you are a robber or you could not make fifteen or twenty thousand dollars per year. The point of exacting large fees from those able to pay is overlooked by many dentists. A large fee charged by one man helps his neighbor that much; as Dr. Simpson says, makes the ten dollar fee easier for the next man. I know dentists having wealthy patients coming to them in automobiles, yet they charge these people no more than the poorest patients coming into their offices. This is an injustice to the poor patient and an injustice to the poor *dentist*.

The question of the students received by colleges is a subject discussed pro and con for many years. We know there are many students in colleges who will never make dentists, and it is unfortunate we do have any without all the qualifications, but I know from experience if you tell them they had better give up dentistry and go to horseshoeing, or bookkeeping, they would only be insulted and go to another college.

The suggestion of having an exchange for our information in regard to deadbeats is commendable and should be attempted. We are all being "gouged" at times by these "professional crooks," as they deserve to be called, and the sooner we get some method to stop this the better.

I regret very much that I am not better prepared to discuss this very intelligent paper, but the discussers preceding me have done their work so well I trust you will overlook my shortcomings. (Applause.)

Dr. John B. O'Brien:

It has been our pleasure this evening to hear a paper from Dr. Simpson on a subject which should prove of vital concern and profitable to each of us interested in the modern progress of dentistry. I therefore take great pleasure in its discussion.

The title, "What Is the Matter With Dentistry in St. Louis?" presupposes there is something the matter, and quite naturally we wish to analyze the question on its merits in an attempt to find our true position in the cosmic scheme of things. Dr. Simpson has delved deep into the why and wherefore of our affairs, as they seem to exist, and left us "naked to our enemies." He has taken an inventory of our defects and his arguments seem almost incontrovertible.

It is a strong indictment, gentlemen, of this old and honored society to be called "before the mat" as we are this evening, and no doubt it will prove of great benefit if we accept it in the proper spirit. It is a very limited and neglected intellect which does not acknowledge its shortcomings; but are the Doctor's strictures wholly merited? Is dentistry in St. Louis below the average? From my acquaintance with the dentists of St. Louis, I should say many are most capable and would average well with other cities, for much "shoddy" dental work is done everywhere. To paraphrase Lincoln's famous truism, "All dentists are remiss some of the time, and some dentists are remiss all of the time, but all dentists are not remiss all of the time."

Dr. Simpson evinces an analyzing mind. He proves to us he has a kick coming, and has put his whole "sole" into it, but with his naturally engaging and urbane manner of addressing us, he talks pessimistically. His criticisms are to the point but he leaves us no note of cheer. We are left to flounder about in the "slough of despair." Being a man of capacity and as original as sin, he deprecates and insinuates, then leaves us to chew the "cud of reflection" as best we may. He speaks to us tonight in a witty, though gravely sepulchral tone, and one not knowing his otherwise sunny nature would think he was born in a graveyard. (Laughter.)

Gentlemen, things dental may be bad, conditions may be all he says they are; but dentistry, to my mind, is on the upgrade, here as elsewhere. We, in St. Louis, are conservative, perhaps too much so; we would like to be different, but cannot easily shake off our natural ennui. Some of us had begun to think we had a great future before us, if we could only catch up with it; yet the Doctor tells us some would do much better as chorus singers, porch climbers, or even as hod carriers. He even hints some of us would be more successful in treking out west and capitalizing an abandoned hole in the ground. Dr. Simpson, I beg of you, do not encourage the weaker members to inflict their vocal powers on an already afflicted public, and as for hod carriers, not one of us has "brogue" enough to carry us up the first flight.

"Your lean and hungry Cassius is never betrayed into a laugh, and his smile is more cadaverous than his despair." According to the Doctor's dictum, we are now, right now, in the palmiest days of our ignorance as to what constitutes modern dentistry, and his indictment of us is as cold as charity. Our intelligence tells us better. I therefore, in the name of the dentists of St. Louis, deny the allegation, and what is more, gentlemen, I defy the "alligator." Dentistry in St. Louis may be "on the bum," but my hopeful nature persuades me to believe it is not getting "bummer."

Are we cankered by mutual distrust of each other? If so, what an unhappy state of affairs. No progress is worth while if we do not act in full accord, and give generous and helpful effort for a better, a more noble standard of action. Let us have high ideals, work ceaselessly for the higher things in dentistry. I admit a little virtuous knocking does good at times, but let it not develop into a chronic form. Some of us, perhaps all of us, think we are moving forward in the current of progress, when according to Dr. Simpson, we are slowly but surely sinking into the inky darkness of obscurity. As to the comparison of dentistry in St. Louis to other cities, I am like the fellow who said, he would rather be in jail in Missouri, than at large in Kansas. If dentistry is bad in St. Louis, it is not so bad that we cannot improve it; the noble men who have gone before, and the splendid talent yet in our midst, leaves us a rich heritage of hope for the future. Many of us were nurtured in the bracing school of poverty, and by honest effort and conscientious endeavor we are going to win a grand, a noble name for dentistry in St. Louis, and work in a concerted way for all that will advance the welfare of each member of our society.

In conclusion, I wish to commend Dr. Simpson's paper. He has a sparkling wit, and a keen satire, worthy of a statesman, but do not allow your spirits to fail you because of his well-meant chiding. "Talent, when disciplined, is always sure of a market." Let us renew our allegiance to the cause of better dentistry, and strive to improve and perfect ourselves. "Trifles make perfection, but perfection is no trifle." I close with the wish of the Irishman from Counemara, "May bad luck follow us and never overtake us." (Applause.)

DR. WALTER M. BARTLETT:

When I heard that Dr. Simpson was going to read a paper, the title of which was, "What is the Matter with Dentistry in St. Lous?" I made up my mind I would not come down here, for

I feared if I came I would say something which perhaps I would regret and make more enemies in the dental profession. Since I have been called on I am sorry I did not jot down my thoughts on paper, for I could have made statements that I believe could have been substantiated.

I do not believe there is anything the matter with dentistry in St. Louis from a financial point of view, considering the number of automobiles I saw lined up in front of this building when I came in, which represents about one-twentieth of the number of automobiles owned by dentists in St. Louis. We seem to figure well financially. The trouble with the dental profession is that it is permeated with commercialism; the commercial side predominates over the true professional spirit.

Dr. Simpson speaks of the lack of papers written by members of this society. I know during the twenty-six years I have been a member of this society, some of the very best papers we have had, have been contributed by members of the society. The lack of paper writing in this society at the present time is due to the fact that the profession of the city do not show the essayist the proper courtesy by coming here and listening. (Applause). They look upon the home talent as one of the lost arts. It has been my observation when a local man labors hard to get up something scientific to present to this society and comes here to read it, he finds an audience of thirty or forty; while if someone from out of the city came here, the auditorium would be filled.

Although there are some exceptions, nearly every scientific paper written today is tinged with commercialism. If you will read your journals carefully saying to yourself, "This is the forerunner of something whereby the essayist is to gain financially," you will usually find it to be the case. These individuals write papers and read them before societies for the sole purpose of getting the rank and file interested in new methods. If these methods are adopted, you will soon realize that before you can put them into practice you will have to invest in a product which they are directly or indirectly interested; a medicament, an appliance, special forms of teeth, or some literary work. Again, there that this feeling exists. You must remember you are conducting a one-man business, and instead of getting closer, we are getting farther apart.

I was amazed to hear one of the discussers here this evening in speaking of prophylaxis say, that the patient was turned over to the office girl, or a more high-grade term, the dental nurse, for the prophylactic work. There is a member of the state board in this city. Is he sleeping, or is he neglecting his duty? That nurse or that person who cleanses teeth is practicing dentistry without a license and is violating the state law of Missouri. I would like to call Dr. Roddy's attention to this, in whatever office he finds the assitant cleaning teeth he should prosecute the assistant, as well as the proprietor of the office.

As to specialists, they have come to stay, we need them. I believe in specialization, and they should be encouraged along these lines, for a man who devotes his time to one special part of dentistry becomes more proficient than the one who attempts to do all in dentistry. The specialist is not supported for the simple reason the almighty dollar stares the practitioner in the face. He is afraid to let go of anything, when he himself knows he cannot do justice to the given case. Among the practitioners of dentistry we have men who will treat every lesion of the oral cavity, I heard the other day of one who treated a patient for tonsilitis. Some do not believe in the prosthetic specialist, but we have a great need in this city for a man who will devote his time and attention to that branch of dental science. The same men who do not believe in supporting a man who specializes in prosthesis would not hesitate a moment in sending his impressions to a dental laboratory. Again, the almighty dollar, he can get something out of that.

The question of fees comes up; I thing nine-tenths of us are untruthful about fees. As long as the gentleman has entered into personalities without mentioning names, I assume I may have the same privilege. I have heard of some remarkable fees obtained in this city recently, some *remarkable* fees. The fee of $1,500 for an entire denture did not compare with one I heard of recently, to say nothing of crowns and inlays; but it is a queer thing when I get hold of some of these patients who have been in the habit of paying two or three hundred dollars for inlays, it is a pretty hard matter for me to get a dollar out of them. I believe any man who gets a legitimate fee for his services in St. Louis is assisting those who do not; as the essayist says if we have some men in this town who charge big fees, we should thank them for it will assist us in getting a fee in proportion to the services rendered.

In the question of lack of skill in St. Louis dentistry, I do not believe the essayist has been just. It is my good fortune to have observed the work of densists from all over the United States, not the mediocre dentists, but men of good standing whose name you constantly see in your dental journals, supposed to be what you would call topnotchers; and I tell you, gentlemen, the work I see coming from other dentists in this city, compares most favorably with the work done by dentists of other cities. I do not believe we are lacking in skill, and Dr. Kennerly struck the keynote when he said that perhaps we only see each other's failures. I know I have failures in this town some of you may have seen, but I feel I have some good work; and the man who does not have some failures, God bless him, he has no practice with which to have failures. (Applause.)

Dr. E. N. Beall:

I consider it a great privilege to listen to a paper such as Dr. Simpson has given us. It is also a high compliment to be asked to discuss such a masterly arraignment of the dental profession. However, the comparison of the present status of dentistry in St. Louis with that of the past is hardly fair. St. Louis was then very much less metropolitan than it is to-day. People of kindred interests met with greater frequency, and personalities such as the essayist named leavened the whole professional mass. Ideals exist to-day as they have in the past, but the opportunities for association are lessened. To overcome this why not establish study clubs in different parts of our city? As it is now we meet here once a month, listen to a paper, hear it discussed, go home and promptly forget it. It is unfortunate that we would rather hear a paper by a "highbrow" from foreign parts than a local man. Is this not due to lack of acquaintance with the essayist of local fame? How many of you know half a dozen members of the profession in the city intimately enough to discuss your mistakes and problems with them? It is only by almost daily contact, such as you find in the business world, sit down. After a while they will have the nerve to say a little more, and may eventually be able to write papers.

In looking around I see many whom I know are capable of writing good papers, but they sit here and are never asked to discuss the papers. I do not know how the discussers are

As to the question "can fees be materially advanced unless the service is improved?" absolutely not. There are some men in the profession satisfied to put in gold and amalgam plugs instead of restorations. These men are either too lazy, lack the necessary qualifications to learn, or deluded into the idea, it is not worth the effort, it being impossible to collect a larger fee for the more laborious operations, thus losing sight of the fact that with improved efficiency a larger fee invariably comes.

From the facts brought out by the essayist it seems some of our fraternity claim originality and monopoly of skill they do not possess. We will draw a cloak of charity over these, may they see the error of their ways. To the "knockers," I can only say, throw away your hammer. It will lead to a better way of living, a better way of thinking, and better deeds.

Dr. Harry R. Faherty:

There is one point I would like to bring out in Dr. Simpson's paper, which has served its purpose beautifully, because it has stirred things up, and that is what this society needs. As a comedian. Dr. Simpson would make Al Jolson go down to Chelsea Island, and jump into the reduction plant, but he is not consistent in mixing wit and pessimism, which are incompatible. All of us have our pessimistic days and our optimistic days, and I know they do not mix for on one of my most pessimistic days I picked up a copy of "Life" and the first joke I saw turned everything to optimism. A fellow had purchased a cigar and remarked to the dealer that it was a very rotten smoke. "Well," said the dealer, "you shouldn't kick, you have only one and I have almost 2,000."

The reason we do not have papers from St. Louis men is because we haven't confidence in ourselves; we have to gradually educate men to write papers. The proper way is to start them by discussing the other man's paper. Every month our announcements have about the same discussers on it, which does not give the little man any chance to work up to where he can write a paper. I think it would be well to have different men discuss the papers each month; start young men in to discuss papers where they can get up, compliment the essayist, and then is the man writing along the lines of his own attainments for the purpose of creating a demand for his services as a lecturer before societies at five dollars per head, which seems at the present time to be an accepted ethical procedure by many.

selected, but I know I have heard complaints of having the same men and I believe we would have a larger attendance if the discussion was more general. I do not believe a city as large as St. Louis has any business going outside for its essayists. It should not be necessary. (Applause.)

DR. CLARENCE O. SIMPSON:

My system is freed of about all I had to say. I appreciate the reception of the paper and the kindness of the discussers, although some of their extravagant praise approached sarcasm.

Dr. O'Brien stated that I criticised conditions but suggested no relief. He received an incomplete copy of the paper, which was written in installments, and at that time I had found no relief. The apology or complaint offered by some of the discussers, that they had insufficient time in which to prepare their discussion was due to the fact that the paper was not completed. It is not a bad idea, anyway, there has been many a *good* paper exploded by giving the discussers too much time to analyze it. (Laughter.)

In reply to Dr. Fruth's remarks about spreading broadcast the statements made in the paper and discussion, I assure you it will be properly expurgated before publication. I have no desire to parade our faults before the profession at large.

I thought Dr. Kennerly was going to "get the goods on me" when he sprung this 75-year-old paper, and prove me a plagiarist. I wish I might have had a blazed trail to follow; there was an abundance of material, but presenting it in a convincing form was an undertaking which I feel has been but partially accomplished. Dr. Conrad, as well as some others, was not mentioned in the list of notables because he is not an old man.

Referring to Dr. Bartlett's observations of the commercialization of dentistry and that a paper was usually the forerunner of something to sell, I promise him this is to be one of the exceptions, as my inferior commercial ability confines my prospects to the true professional compensation. The reference to college conditions was made with the mental admission and no desire to disclaim my connection with a local dental school, and having graduated from one of the worst commercialized schools in the country. It was mentioned with the other factors which may have influenced the prevailing standards of practice.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

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EDITORIAL.

DENTAL SERVICE IN THE PUBLIC SCHOOLS OF CHICAGO.

So much is being said of free dental service in other cities that it would seem appropriate for Chicago to refer occasionally to the work that she has been doing for several years on behalf of the poor children in her public schools. It is frequently the case that a work which is carried on quietly and without blare of trumpets is taken too much for granted by the public and the profession, and its real significance is lost sight of. This is in some sense the case with the dental work being done in the schools of Chicago.

The work was first started by a committee appointed by the Odontological Society of Chicago, which was shortly after merged into a committee of the Chicago Dental Society. For a time three infirmaries in as many public school buildings were operated by voluntary service on the part of members of the dental society. Then, in 1912, Mr. Julius Rosenwald, recognizing the value of the service, equipped additional infirmaries till ten in all were established, and volunteered to pay the salaries of ten operators till the city could be induced to take over the service. Meanwhile the city Health Department had added a dentist to its staff, and this dentist was made supervisor over the ten infirmaries. In January, 1914, the city took over the infirmaries and they have since been operated under the Department of Health.

Very early in the movement the Englewood Dental Society, in conjunction with the United Charities of Chicago, started an infirmary manned by voluntary service on the part of its members, and this has been in operation ever since. Now it is proposed to merge it with the city infirmaries.

In addition to the service mentioned, the members of the Chicago Dental Society voluntarily made inspections of nearly 100,000 children in the public schools, and the tabulations from these inspections proved a very eloquent argument for the necessity of this work.

The *Bulletin* of the Department of Health reports that during the past year the number of children examined at the infirmaries was 10,760. There were 31,616 treatments, 28,421 fillings, 85 crowns, and 23,457 extractions.

For the coming year the Commissioner of Health endeavored to have ten more infirmaries established, making twenty in all, but the city budget would not warrant it. In fact, there was in certain quarters a disposition to throw out the appropriation for free dental service, till a delegation of dentists appeared before the finance committee of the city council and presented the claims for a continuance of the service. Before the delegation had left the room a motion was made to appropriate $12,000 for the work during the coming year. It will usually be found that public officials are very cordial to this movement as soon as they become informed as to its great value to the community. The thanks of the profession and the people of Chicago are due to the members of the finance committee, who passed this appropriation in the face of a burdensome and overloaded budget.

BOOK REVIEWS.

PROSTHETIC DENTISTRY: By *James Harrison Prothero, D. D. S.*, Professor of Prosthetic Technic, Prosthetic Dentistry, and Metallurgy in Northwestern University Dental School, Chicago. Second Edition, Revised and Enlarged. 1,200 pages, 1,400 illustrations. Price, $8.00. Medico-Dental Publishing Co., Chicago, Distributors.

It is a real pleasure to review this book. In many ways it is the most comprehensive work ever written on the subject, and under the simple title of "Prosthetic Dentistry" it includes besides artificial dentures of all kinds such subjects as "Crown Work," "Bridgework," "Porcelain and Metallic Inlays," etc. It has a chapter on

"Metallurgy" alone of 140 pages, a very valuable chapter taking up all of the essential phases of the subject as it applies to dentistry. Then there is added a brief history of prosthetic dentistry of 100 pages which rounds out the work most acceptably. The student or practitioner who reads this book will be greatly enriched thereby, even though he may not be actively engaged in the practice of prosthetic dentistry himself. The vast amount of work expended on the book is apparent on every page and when one realizes that there are 1,200 pages, one can readily appreciate the years of application which Dr. Prothero has given to the work. The literature of dentistry is greatly enriched by the appearance of this book, which is in every way a credit to those concerned in its production.

A TEXT-BOOK UPON THE PATHOGENIC BACTERIA AND PROTOZOA. FOR STUDENTS OF MEDICINE AND PHYSICIANS. By *Joseph McFarland, M. D.,* Professor of Pathology and Bacteriology in the Medico-Chirurgical College, Philadelphia. Eighth edition, thoroughly revised. Octavo of 807 pages, with 323 illustrations, a number of them in colors. Philadelphia and London: W. B. Saunders Company, 1915. Cloth $4.00 net.

McFarland's work needs no introduction to members of the dental profession. Neither does it need commendation. In fact, any work which has run into eight editions speaks for itself, and it may be said conservatively that McFarland has long since been considered the standard text-book on the subject. For dentists this work is of especial interest because of the author's frequent reference to the work of the late lamented Miller. The present edition has undergone a complete revision, having been practically rewritten.

THE CARE OF THE TEETH. By *Charles A. Brackett, D. M. D.,* Professor of Dental Pathology in Harvard University. 63 pages. Harvard University Press, Cambridge, 1915.

This is one of the "Harvard Health Talks" series, the substance of which are public lectures delivered at the Medical School of Harvard University and published under the auspices of a committee of the Faculty of Medicine. Anyone familiar with the writings of Professor Brackett will vouch in advance for the excellence of this little book. It is so clearly written in such perfect language that it is a pleasure to read it aside from its value as a means of instruction. If all the advice sent out to the public on the care of the teeth had been as well expressed and as sensible as this, it would have been much better for all concerned.

"SPEAKING OF OPERATIONS—" By *Irvin S. Cobb,* author of "Back Home," "Europe Revised," etc. Published by George H. Doran Company, New York.

If anyone can get fun out of a surgical operation—aside from the surgeon himself—it is Cobb. This book is not long enough to be wearisome, not heavy enough to be burdensome, not serious enough to be solemn. It is telling the patient's side of it with the patient's point of view, poking fun inferentially at some of the perfunctory red tape in some of our medical practices. If a man has had an operation he will recognize the intuition of the author, if he is going to have one his pathway will be made smoother by reading this book. Cobb dedicates the work to two classes:—"Those who have already been operated on; those who have not yet been operated on." Very comprehensive this, and well calculated to attract a large range of readers.

CORRESPONDENCE.

Chicago, February 9, 1916.

OPEN LETTER.

To the Officers and Directors of
The Dental Protective Association of the U. S.

GENTLEMEN:—

Some of the statements appearing in your Report, printed in the February issue of the DENTAL REVIEW, are somewhat surprising to me.

You state that those who accepted the Taggart agreement cannot join associations "organized primarily to fight Doctor Taggart." I did not know there were such associations in existence. There are, of course, several bodies in the field whose aims are similar to those of the Dental Protective Association of the United States, which were, perhaps, called into being under the stress of the Taggart litigation, but to say that they were formed "primarily to fight Doctor

Taggart" would be just as wrong as to say that your organization was formed to fight Doctor Low.

The Taggart or Low cases are merely incidents in the activities of such associations. Therefore, while it is true that the agreement with Doctor Taggart prohibits a licensee from joining in a fight against him, it does not prevent any man from affiliating himself with a body whose aim is the protection of its members from process patent exploitation. For this reason we of the Dentists' Mutual Protective Alliance have a special sequestered fund of all money paid in by those who have a license from Doctor Taggart, and no part of this fund is used to pay any of the expenses incurred by the Alliance in the Taggart litigation. This money will, of course, be used in other litigation, if necessary, that may come up in the future which these men have not bound themselves, by previous agreement, not to defend.

Their membership in the Alliance is practically the same as in the Dental Protective Association, which, while not permitted to use any of its funds against Taggart, can and in fact must defend its members from other patentees.

You give as a reason for the growth and success of the Dental Protective Association the fact that its purpose is to fight "worthless" patents, but "not to defraud any man of his just due." How can you differentiate? How can you tell which are worthless and which are good? Are you not abrogating to yourselves the functions of a court in assuming such a position? And even a court would not pass an opinion upon a patent without exhausting all of the available facts in the case. Is it not true that numbers of patents are invalidated every year, and does this not prove that the Patent Office can and does err?

Again, there can be no small question that you make this statement with the Taggart patents in mind because, first: there is no other case on record in which the Dental Protective Association has taken this stand; and, second: this is the very reason Doctor Crouse gave for compromising with Taggart instead of bringing the patents into court.

Now to carry this argument to its logical conclusion: if your agreement with Doctor Taggart was prompted by a desire not to defraud him, then it follows that those who have not joined with you and have taken advantage of their legal privilege to let the courts decide the question, are defrauding him of his just dues. Along this line the Appellate Court in Washington, which has declared one of the Taggart patents invalid, is, of necessity, a party to the effort to defraud. Surely you don't mean that.

Still another point: You say that owing to the low price of 88 cents a year for which Doctor Taggart was "practically giving away his method," you recognized the justice of the demand that a licensee should not have the right to join in litigation against him, and, therefore, allowed him to put this clause in the agreement. Your attitude seems to be that in so doing the Dental Protective Association made a wonderful bargain.

I am not at all impressed with it. Personally I think you agreed to pay a pretty high price—high enough even without the clause in which you promised not to change your mind for seventeen years. Eighty-eight cents a year—$15.00 for the life of the patent—looks cheap, but if you multiply that by 35,000, the number of dentists in this country who were expected to embrace the opportunity, it will amount to over a half million dollars—rather a neat, little sum to pay for a patent which had not seen the inside of a court and which had nothing to back it except the fact that it had been granted by the Patent Office. Do you think a manufacturer or a business man would pay that much?

Please do not misunderstand me. I am not trying to criticize you. I know what your work has meant during all the years. I am convinced also that your intentions were for the best at all times. But you presented your case entirely from your own point of view. We also have something to say and feel that our side should likewise be heard.

Respectfully yours,

M. D. K. Bremner,

President The Dentists' Mutual Protective Alliance.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Burning Out Wax:—Wax in a casting investment should never be burnt out with a very hot flame, causing the melting wax to boil up through the sprue hole. Avoid this and you will have smoother castings.—*Robert J. Cruise, Chicago, Ill.*

Impinging Inlays:—In fitting gold inlays to cavity where there are intricate conditions or surfaces, heat inlays to redness (provided they are 22 carat gold). This will oxide them so that any impinging surfaces can be readily seen and corrected.—*C. E. Allshouse, Chicago, Ill.*

A Good Temporary Filling:— A stiff mix of pure zinc oxid and oil of cloves rolled up into a pellet with bibulous paper makes an excellent temporary filling for sensitive cavities. It can be used in any cavity where temporary stopping is indicated. It sets quite hard.—*J. F. Nelson, Washington, Iowa.*

Making Wax Model for an Inlay:—To make certain that wax has been forced to all parts of a cavity a thin copper band loosely fitted about tooth should be used in each case. It confines the pressure and pressure causes a density of wax so necessary for definite gold castings.—*W. D. N. Moore, Chicago. Ill.*

Matrix Using Celluloid:—Lock the strip together by cutting on opposite sides, then heat small serrated flat nose pliers and fuse the celluloid by pinching with the heated pliers. The celluloid in Kodak films is suitable for this work when the coating is removed. To remove coating wash in hot water.—*E. T. Evans, Decatur, Ill.*

Repairing a Broken Goslee Tooth:—A broken Goslee tooth on a short bite bridge may be easily repaired stronger and better than when originally made by using a facing and molding wax in place of the original porcelain. Cast and a splendid strong tooth results.—*J. S. Bridges, Chicago, Ill.*

A Point Often Overlooked:—In placing a matrix band for amalgam fillings it is well to see that the band is sufficiently rigid to prevent bulging at the gingival margin while compressing the filling into the cavity. A small wooden wedge seems most effective as suggested by Dr. Black. In extracted teeth many otherwise perfect amalgam fillings will be found defective from neglect of this precaution. The subsequent trimming of the filling in these positions is in some cases a matter of difficulty.—*A. G. Salisbury, Takaka, New Zealand.*

MEMORANDA.

NORTHERN OHIO DENTAL ASSOCIATION.

The annual session of the Northern Ohio Dental Association will be held in Cleveland, June 1, 2, 3, 1916.—Clarence D. Peck, Secretary, Sandusky.

THE TEXAS STATE DENTAL ASSOCIATION.

The Texas State Dental Association will meet in Dallas, Texas, May 9, 10, 11, and 12, 1916.—W. O. Talbot, Secretary-Treasurer, Fort Worth.

ILLINOIS STATE DENTAL SOCIETY.

The fifty-second annual meeting of the Illinois State Dental Society will be held at Springfield, Illinois, May 9th, 10th, 11th, 12th, 1916. President, J. P. Buckley, Chicago. Secretary, Henry L. Whipple, Quincy.

CONNECTICUT STATE DENTAL ASSOCIATION.

The fifty-second annual convention of the Connecticut State Dental Association will be held at the Hotel Griswold, New London, Conn., June 13, 14, 15, 1916. Papers and clinics of unusual interest have been secured, which, with the excellent accommodations offered by the Griswold, will make this the most attractive meeting in the history of this association.—Elwyn R. Bryant, Secretary, New Haven, Conn.

INDIANA STATE DENTAL ASSOCIATION.

The fifty-eighth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, May 16, 17, 18, 1916. Prospective exhibitors should write to E. D. McLaughlin of Greensburg, Indiana, who is master of exhibits. The program will be made up exclusively of Indiana dentists and a cordial invitation is extended to members of other state association to attend this meeting.—A. R. Ross, Secretary, Lafayette.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants who may desire to practice dentistry in Michigan, will be held in the Dental College at Ann Arbor, beginning Monday, June 19, 1916, at 8 o'clock a. m., and will continue through Saturday, June 24th. For application blanks and all further information application should be made to E. O. Gillespie, Secy.-Treas., Stephenson, Mich.

ANOTHER NEW DENTAL JOURNAL.

The appearance of an Italian dental journal, *Annali di Odontologia,* marks a new impetus to dental periodical literature in Italy. The editor is none other than the distinguished Professor Angelo Chiavaro of Rome, and this is sufficient to guarantee that the publication will in every way be a credit to the profession and to the country from which it is issued. We welcome the new journal to our list of exchanges and we bespeak for it the hearty coöperation and support of our Italian confrerés.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

At the last annual meeting of the American Institute of Dental Teachers, held at Minneapolis, Minnesota, January 25th to 27th, 1916, the following officers were elected: President, Dr. Shirley W. Bowles, 161 I street, Washington, D. C.; vice-president, Dr. John F. Biddle, 517 Arch street, Pittsburgh, Pa.; secretary-treasurer, Dr. Abram Hoffman, 529 Franklin street, Buffalo, N. Y.; executive board, Dr. A. W. Thornton, Montreal, Canada; Dr. R. W. Bunting, Ann Arbor, Michigan, and Dr. A. D. Black, Chicago, Ill. The next annual meeting will be held at Philadelphia, January 23rd, 24th and 25th, 1917.

DEPARTMENT OF DENTISTRY, COLLEGE OF JERSEY CITY, RECOGNIZED.

At the meeting of the board of education of the State of New Jersey, held in Trenton on January 8th, 1916, the newly organized Department of Dentistry of the College of Jersey City, was officially recognized and the degree of D. D. S. (Doctor of Dental Surgery) was approved. The college was also highly complimented upon their good work and splendid progress. Besides the Dental Department, the College of Jersey City has also a Department of Pharmacy, which is recognized by the Regents of the University of New York. It is needless to state that prominent men of the medical, dental and pharmaceutical professions are connected with this institution, which has made remarkable progress since its foundation in 1908.

GEORGIA STATE DENTAL ASSOCIATION.

The forty-seventh annual meeting of the Georgia State Dental Association will be held at Macon, Ga., June 8th, 9th, and 10th, 1916, beginning at 11:00 a. m., Thursday, June 8th. The program committee is making preparations to bring to this meeting some celebrities, who will give illustrated lectures on some very important topics concerning the dental profession; also same men who will give clinics which will be more than interesting to all who attend the association. Besides these men, there will be a program of merit given by local dentists. All ethical dentists in Georgia are respectfully invited to attend, and become a member of this great state association. We extend a most cordial invitation to the members of other associations to meet with us. For further information, address the secretary, Dr. M. M. Forbes, 803-4 Candler Bldg., Atlanta, Ga.

THE DENTAL MANUFACTURERS CLUB OF THE UNITED STATES.

An exhibit will be held in the spacious and commodious Hotel Auditorium, Chicago, Illinois, on April 4th, 5th, 6th, and 7th, 1916. The Auditorium Hotel will be the scene of one of the greatest exhibits of dental manufacturers, including equipment, furniture, materials and instruments ever shown in this country. Preparations are under way for an elaborate, scientific and most highly interesting and educational exhibit, with table clinics, and demonstration under direction of men "who make the goods," assisted by expert demonstrators and lecturers. Parking space for automobiles will be arranged for, as will all other details for the comfort and convenience of visitors. The exhibit committee is endeavoring to make this exhibit the greatest of all exhibits of dental manufacturers and most highly interesting and educational in the way of sound and practical table demonstrations of particular interest to the profession.—A. C. Clark, Chairman Exhibit Committee.

NATIONAL DENTAL ASSOCIATION.

The attention of the dental world will be focused on Louisville, Ky., from now until next July. Louisville, where the National Dental Association will hold its 1916 meeting, is not only Kentucky's metropolis but it is the largest city near the nation's center of population. Because it is accessible to all other parts of America; because its hotel facilities are so abundant and its transportation facilities so nearly perfect, it has come to be, within recent years, one of the leading convention cities of the United States.

Louisville is an exceedingly interesting city to the visitor from an educational standpoint, being a center of culture and of art. Admirably located in the beautiful Ohio Valley, it is known as the Gateway of the South and through the progressive spirit of its citizens and its favorable geographical location, it has become an industrial center of importance. Radiating from it are some of the country's most famous highways which have caused it to become the mecca of the motorist. The beautiful architecture of its public buildings, its wonderful system of parks and boulevards, its proximity to world-famous points of interest for the tourist and its well deserving reputation for hospitality have given it a distinct prominence in the mind of the sightseer and the traveller. Within a short automobile ride is one of the seven great wonders of the world—Kentucky's famous Mammoth Cave—which no visitor to Louisville can afford to miss. Within a few hours from the convention halls are West Baden and French Lick Springs, known to the world as the Carlsbad of America. One of its most beautiful side trips of interest is an automobile ride through the far famed Blue Grass Region, the home of some of the world's famous thoroughbred horses. Famed in song and story, this most beautiful farming region has for years been a famous resort for the lover of sports of kings. The visitor should not miss the boat trip of a few hours up the Ohio and Kentucky rivers as far as High Bridge, one of the most wonderful pieces of modern engineering. These trips of interest and many others are to be provided by the entertainment committee.

The twentieth annual session of the National Dental Association promises to present a program never surpassed in its history. Ten thousand of your fellow practitioners are planning to attend. Make your plans now, for you cannot afford to miss this wonderful meeting and you may never have another opportunity to visit the most hospitable state of this broad land. Do not forget to bring your wife, for committee on recreation and entertainment have made their plans largely with the view of her comfort and her happiness. You and she will feel at home in Louisville, July 25, 26, 27, and 28, 1916.

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THE PROBLEM OF DENTAL EDUCATION IN THE LIGHT OF THE PUBLIC DEMAND.*

BY EDWARD C. KIRK, D. D. S., SC. D., PHILADELPHIA, PA.

Amongst a people dominated by the ideal of democracy education inevitably becomes utilitarian in its object. Knowledge as an intellectual adornment or for the ends of culture alone is an ideal which flourishes in the more congenial atmosphere of a social aristocracy. When Herbert Spencer fifty-five years ago (1861) in his essay on education, asked the question, "What knowledge is of most worth?" and in his answer thereto set forth with convincing clearness the superlative usefulness of scientific knowledge, he propounded a problem subsequent inquiry into which revolutionized educational ideals throughout the world.

Writing at the mid-Victorian period when the aristocratic ideal of government, both social and national, was dominant, it is not difficult to imagine the profound impression produced by his trenchant arraignment of the pedantry of the educational system then in vogue, based, as much of it was, upon the belief in knowledge as an adornment of the mind useful mainly to the degree that it impressed others with the intellectual superiority of its possessor and so enabled him to attain social importance and power.

Let me quote the following extract as representing the educational conception against which Mr. Spencer's essay was instrumental in precipitating a revolution leading up to the present democratic ideal of utilitarianism as an end in education. He says: "It is not as we commonly suppose, that there are no governments but those of monarchs, and parliaments, and constituted authorities. These governments are supplemented by other unacknowledged ones that grow up in circles in which every man or woman strives to be king or queen or lesser dignitary. To get above some and be reverenced by them, and to propitiate those above us is the universal struggle in which the chief energies of life are expended.

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*Read before the Chicago Dental Society, January 28, 1916.

"By accumulation of wealth, by style of living, by beauty of dress, by display of knowledge of intellect, each tries to subjugate others; and so aids in weaving that ramified network of restraints by which society is kept in order. It is not the savage chief only, who, in formidable war paint, with scalps at his belt, aims to strike awe into his inferiors; it is not only the belle who, by elaborate toilet, polished manners and numerous accomplishments strives to 'make conquests,' but the scholar, the historian, the philosopher, use their acquirements to the same end.

"We are none of us content with quietly unfolding our own individualities to the full in all directions; but have a restless craving to impress our individualities upon others, and in some way to subordinate them. And this it is which determines our education. Not what knowledge is of most real worth, is the consideration, but what will bring most applause, honor, respect—what will conduce most to social position and influence—what will be most imposing.

"As, throughout life, not what we are, but what we shall be thought, is the question; so in education, the question is not the intrinsic value of knowledge so much as its extrinsic effect upon others. And this being our dominant idea, direct utility is scarcely more regarded than by the barbarian when filing his teeth and staining his nails."

The underlying elements of human nature change but little and that little is the product of a slow evolutional process, hence, while the old barbaric instincts which, in the expressed belief of the great English philosopher and scientist, were the dominant forces in the educational systems of his time, there is ample evidence to support the belief that the same instincts largely determine the objective ends of much of our present day educational activities. In accepting Mr. Spencer's conclusions as to the direct usefulness of scientific knowledge and the superiority of useful education to education as a mere intellectual adornment, do we not still conceive of education as a source of power and utilize that power mainly for the acquisition of wealth, of social position and the attainment of "honor, applause and respect?"

I am not unmindful of the fact that even in this age of practical utilitarianism scientific education is pursued by many for the sake of its cultural results to the individual, quite apart from other considerations, just as the study of language, history, art and literature is pursued solely for the ends of culture, a factor the importance of which cannot be overestimated, for it is of the cult of these that the inspired teachers, the transmitters of knowledge are produced.

The spirit of the age is utilitarian and its insistent demand is for the practical, for the kind of knowledge that is directly useful to the attainment of the ends of modern living, in order that we may live and live more abundantly.

The healing art in all its departments and in all its multitudinous contacts has felt the insistence of this demand, and its educational system has been largely shaped in order that it may adequately minister to the needs of which the public demand is the expression. Dentistry, as a department of the healing art, has felt the same stress, and its activities both educational and practical are its response thereto. Before this society two years ago Dr. Mayo expressed the oft quoted belief that the next important advance in preventive medicine should come from the dental profession, and said the only question was "will the dentists take the step," since which time events have been so shaping the direction of dental progress with reference to preventive medicine that it behooves us to consider the situation with some care in order that when the next step is taken we shall be prepared to take it in the right direction, intelligently and in good company. I say in "good company" because I am persuaded that we shall not take it alone, but in cooperation with the trained medical scientist.

In October, 1910, Dr. Wm. Hunter of London delivered his famous address on "Oral Sepsis" at McGill University, Montreal. Notwithstanding the fact that fully a quarter of a century previously Prof. W. D. Miller in his classic report of researches on the Human Mouth as a Focus of Infection, as the result of both experimental demonstration and clinical observation, had drawn attention to the fact of inflammatory reactions occurring in remote parts of the body from septic conditions in the buccal cavity and had set forth the general principles underlying such focal infections—the far-reaching importance of Miller's communications on the subject, except in so far as they gave impetus to the world-wide oral hygiene movement, were overlooked or ignored by both medical men and dentists, with the exception of a minor group who were interested therein, mainly from a scientific point of view, but whose reiterated expressions of interest and approval received scant practical consideration by the mass of practitioners. Hunter's study of the subject, howeever, from a clinical viewpoint fell upon fertile ground; it not only aroused the immediate practical interest of the medical profession the world over, but because of its justly critical attitude toward the disease producing potentialities of badly conceived and badly executed prosthetic dental restorations and, in justice it must also be said, because of the distinguished author's failure to indicate that he recognized any distinction between good and bad, so called, "American Dentistry," his communication fulfilled the beneficent office of a counter irritant upon the dental professional body which stimulated a wholesome reaction therein toward a critical review of their own standards of work and opened the eyes of all to the dangers of an infected mouth.

The results, which in a general way have flowed from the publication of Dr. Hunter's paper, present some interesting features for consideration. When it was generally accepted in principle and in fact that septic mouth conditions were the source of disease reactions in other parts of the body, or of the body as a whole, the eyes of investigators were focussed upon the problem with a view to working out in detail all of its ramifications: pyorrhea alveolaris, infections of peri-apical root tissues, pulp infections, in fact, all mouth lesions of bacterial origin were brought under critical inspection as possible suspects having criminal tendencies towards pathogenic bodily invasion.

It would not be germane to the purposes of this paper to consider in any detailed way the results of the scientific investigations which have followed in the wake of the pioneer studies of oral sepsis and the secondary infections arising therefrom. What concerns us, for the present, is the effect of these discoveries, for such they are, upon the professional attitude of mind and reflexly upon our educational system both in dentistry and in medicine.

The history of dentistry, particularly since the period when it was first organized upon a professional basis by the founding of the Baltimore College of Dental Surgery, the founding of a periodical literature and the organization of the first dental society in 1839, has been one of isolation from the organized medical profession. The educational curriculum patterned upon the general scheme of the medical curriculum has included as much of those sciences fundamental to the science and art of healing, as in the judgment of the pioneers was deemed necessary for the dentist, with his then relatively restricted field of activity, to acquire as the basis of his educational equipment. To these selected subjects of the medical curriculum were added instruction in the special technical subjects and laboratory manual training required for developing facility in the constructive and manipulative procedures of dental art, the whole constituting the curriculum deemed requisite for the education of the dental practitioner.

Having established a separate educational system and an independent professional organization, the dental specialist preempted as his field of activity the human mouth, with its contained masticating apparatus and its related tissues and organs, a field over which he has thus far held undisputed sway, and in the exploitation of which he has in many ways fully justified his claim to supremacy. So completely have circumstances combined to establish the dental specialty upon a stable autonomous professional basis that medicine, as well as the general public, has conceded to the dentist the practical justice of his claim to professional independence and has accordingly relegated to him the privilege of and responsibility for the care of the human mouth with all the rights, privileges and emoluments thereunto appertaining.

Dentistry in its evolution presents certain well marked and important periods of growth. As characterizing its infancy as a profession one is forcibly impressed by its mechanical and constructive motif. The extraction of defective teeth and prosthetic restorations of lost teeth or parts of teeth were the major considerations of the dental practice and dental teaching of our professional forbears, while their conception of the vital features and relations of the dental organs was a subordinate and oftentimes wholly minus factor of their intellectual equipment.

In proportion as researches into the embryological development, the histological structure and anatomy of the teeth and their related tissues threw light upon their vascular, nervous and nutritional relations to the general body, disorders of the teeth, their therapeutic and prosthetic treatment underwent radical modification and they ceased to be regarded as inert matter that might be treated mechanically without reference to their vital reactions and relationships. So long as disorders of the teeth were assumed to have no bearing upon the individual health other than as interferences with the integrity of the masticating mechanism, medicine, broadly speaking, was content to let dentistry remain in undisturbed possession of its chosen field of activity and to occupy itself with its own problems of bodily health and disease. With the advent of the new science of microbiology and the flood of light which investigation of the human mouth as a focus of infection has thrown upon the casual relation which oral sepsis bears to bodily infection, a radical readjustment of the older relations of dentistry and medicine and a reorganization of the educational systems of both seems to be not only inevitable but imminent.

In his address to the International Dental Federation in August, 1901, Sir Michael Foster, then Deputy Vice-Chancellor of Cambridge University, said that "Education" in order to be effective "should be fashioned after the manner of a cone, starting from a broad basis and narrowing to an apex, for it is the conical bullet that has penetrating powers." President Butler of Columbia University has, I understand, recently rephrased the same thought somewhat as follows: "What we need most is not sharp men, but broad men sharpened to a point." Doubtless all will agree regarding the efficiency of a system of education for any profession shaped upon the plan which the simile of the cone implies.

With respect to dental education then it would seem that in view of existing conditions it needs widening at the base, and that in view of modern developments as to the importance of oral sepsis in relation to bodily health, medical education needs sharpening at the apex.

The problems presented by the systemic and focal reactions arising out of pathologic mouth conditions are not only complex, but composite in the sense that they demand the co-operative attention of not only a scientifically educated dental profession, but a scientifically educated body of medical specialists for their proper and intelligent solution. It is an axiom of pathology that no part of the body can be the seat of disease, that the orderly functioning of none of its parts can be disturbed, without causing a corresponding disturbance of the physiologic mechanism of the whole or of some other part. And as no individual mind can intelligently compass the whole range of the healing art, it is inevitable that the problems of disease must bring to their solution the sharpened intellects of a variety of properly educated specialists.

The general health relations of oral sepsis and particularly of infections of the periapical tissues have given rise to unpleasant and, I believe, unnecessary friction from time to time between dentists and physicians because, on the evidence of a radiograph, the diagnosis of an apical infection has been made, and the physician has promptly ordered the removal of the infected tooth which has been condemned by him to extraction on the assumption that it was the source of a valvular heart lesion, a joint trouble, or on the general principle that because it was infected it should be removed anyhow.

The connection between infected periapical tissues and focal infections in other parts of the body has been too definitely demonstrated to be open for further debate, at least so far as the general fact is concerned. Nor can there be any proper contention as to the soundness of the principle that the source of infection in the periapical tissues should be eliminated, but from the point of view of the dental practitioner, it is beyond the province of the practitioner of medicine to prescribe how or by what means the infection shall be eliminated.

Dentistry has demanded for good and justifiable reasons that the human teeth shall be conserved whenever possible, and it is, therefore, an ingrained article of the dental creed that the extraction of a tooth is the practical confession of therapeutic failure just as certainly as the amputation of a limb or the enucleation of an eye is a therapeutic failure. The conservative and therapeutic resources of operative dentistry are not exhausted by a periapical infection to the degree that necessitates resort to the ultimate operation of extraction of a tooth so diseased. Hence, the prescription of the physician in such cases may and should very properly be "eliminate the infection," but it is within the province of the dentist to determine how it shall be done, and then to do it.

I have directed your attention to this phase of the general matter under consideration for two reasons: first, because it will serve to illustrate in a practical way the need of the broader basic education of the dentist and a similar need for the education of the physician regarding mouth conditions, and second, because it is the type of a difficulty which, owing to the increasing investigation of the systemic relations of mouth conditions, is certain to multiply in frequency unless our educational system is modified in such a way as to develop more harmonious understanding and co-operation among dentists and practitioners of all specialties of the healing art in general.

Our professional interest from a pathologic point of view seems to be concentrated for the time being upon focal infections having a mouth origin; the protean activities of pathogenic bacteria are just now in the spotlight of professional interest, but the preliminary indications, the prodromes, so to speak, of a field of activity are beginning to manifest themselves, which gives promise of an intensity of interest and a fruitfulness of results as great and as important as any which have flowed from the study of mouth infections. Our literature is permeated with the reports of cases of the effects of reflex dental irritation due to abnormal and continued stimulation of the ultimate endings of the fifth cranial nerve in and about the teeth. The list includes almost every form of nervous disturbance from tic douloureux to dementia precox. I have had occasion recently to tabulate the reports of such cases published in a single journal and they total over twelve hundred relating to dental reflex neuroses, of various kinds, of non septic origin. They represent a field which awaits and which certainly invites investigation, a field in which the questions of degeneracy, mal development, mental backwardness, disorders of the central nervous system, of the special senses, bodily growth and nutrition are intimately involved, a field which today is almost terra incognito to both medical men and dentists.

The earlier work of Abraham Jacobi, of J. W. White and others and the later studies of the late Henry S. Upson of Cleveland and A. W. W. Baker of Dublin have directed attention to the importance of the nervous relations of the teeth and the serious reflex disturbances arising from continued dental peripheral irritation. The problems which this important group of disorders present can only be solved by the co-operative effort of a body of specialists whose basic training is broad enough to enable them to intelligently grasp the general principles underlying all medical specialties and whose special training has been of that intensive character which produces the highest intellectual efficiency.

The co-operation of men so trained is a sine qua non if we are to successfully deal with the problems of disease as they are now confronting us, and to secure men with the adequate training a reorganization of our educational systems in the science and art of healing is undoubtedly necessary.

There is required a more liberal preparatory education, liberal in the sense that the mind of the matriculant should have been educated to an appreciative understanding of the major generalizations that underlie scientific thinking and scientific reasoning in all departments. He should have above all such a grasp of language as will enable him to intelligently express his ideas in his mother tongue, and also to render the foreign literature of his profession accessible to him. For the dental profession there is needed a decidedly broader training in the fundamental medical sciences of anatomy with its subdivisions, physiology, microbiology, pathology, pharmacology and physiological chemistry. The lengthening of the time of the dental curriculum will afford a much needed opportunity for improvement in the direction indicated. The so-called practical laboratory and operative factors of the curriculum can be adequately cared for in the latter half of the course. These are readjustments which seem to be obviously needed, but in view of the type of service which is being increasingly required of the dental practitioner, a service relating to the vital rather than the mechanical phase of his field of activity, the demand now and for the future is a reorientation of the dental educational point of view whereby the mechanical ideals of dental practice shall be given their logical status as secondary to the vital and therapeutic ends of dental professional service.

When we have reorganized our educational ideals in that way dental undergraduates will no longer speak of bacteria as "bugs" nor assert that they "bore their way into the dentine" in the process of dental caries. We must not inculcate misconceptions of that character, but if we would avoid them altogether we must demand matriculants whose minds have been tuned by a previous educational system to a reasonable receptivity for the higher order of conceptions.

One other development of our educational ideal seems to be needed as the logical result of the rapid evolution which is now active in all phases of the healing art. We must not be content with a system that educates the man only up to the day of graduation. We hear much of "up to the minute" training, but the involved conception falls short of the public need. We should so educate our students that they will be "up-to-the-minute" practitioners five, ten, twenty years hence or at any time after graduation. And it can be done if the teacher is of that cult who, seeing beyond the limits of a narrow utilitarianism and while equipping the minds of his pupils and training their hands, prepares them to perform all the details of a utilitarian public service, above all this inspires them with his own love of knowledge for its own sake, and for the sake of the larger contact and sympathy with life which its use as culture affords.

It is men so trained for service in all phases of the healing art that I am persuaded the public will demand.

ROOT CANAL TREATMENT AND FILLING.*

BY GEO. C. POUNDSTONE, D. D. S., CHICAGO, ILL.

It is with no small amount of uneasiness or timidity that I undertake to present to you the subject assigned by your Program Committee; first, because the subject is so old and has been discussed so much that I can tell you nothing that is not already in print; and next, because your Chairman begins his invitation by stating that you have been holding several clinics in root canal technique, and then asks me to come and address you—to be but an echo, I fear, of what you have already heard. He a little later admits that it is an old subject, but tries to make it easy for me to accept by stating that one has to be told it often. The best of things become stale after too much rehashing, and none of us like to handle the stale goods. We would rather discuss something that we know nothing about—like pyorrhea cures or inoculation for the prevention of dental caries—because we can get away with most anything in that line and get out of town before the audience recovers; but on root canal treatment and filling, everyone before me is an expert critic and authority, and I shall consider myself fortunate if I am allowed to even finish my paper.

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*Read before the Jefferson County, Kentucky, Dental Society and the North Shore Branch of the Chicago Dental Society.

The biggest problem to decide was what to say and what not to say, where to begin and where to leave off, because the subject of pulp treatment and root canal filling is so broad that several papers could be written without exhausting the subject. My final decision was to touch but lightly upon the treatment side from the medical standpoint, and dwell more at length upon the mechanical treatment in the removal of pulps and the preparation and filling of root canals.

The death of the pulp, whether it be by disease, accident or design, makes it necessary to treat and fill the root canals if the tooth is to be saved for further usefulness, and the degree of usefulness usually depends upon the quality of the workmanship in the treatment and final filling of the root canals. Some knowledge of the cause of death, or the existing condition of the pulp, is necessary to intelligently proceed with the treatment, so it may not be amiss to at least enumerate the various causes of death, and the conditions in which we find pulps when they come to us for treatment.

1. Healthy pulps to be removed either by pressure anesthesia, or devitalized with arsenic, that their roots may be used to support crowns or bridges.
2. Hyperemic and inflamed pulps that must be removed to prevent future trouble and discomfort.
3. Dead pulps—and of these there are those that are producing pus with no odor, and those that are gangrenous with a characteristic odor and no pus. It is important to

differentiate between these two classes of dead pulps, because frequently in the pus-producing ones the apical ends may still be vital and present difficulties in the way of their removal, while in the gangrenous ones there is danger of forcing infected material through the apical foramen and producing an acute abscess. Then there are those dead pulps that have already produced an abscess, either with or without a sinus.

Of the first class—healthy pulps to be removed that their roots may be used for crowns or bridges—careful consideration should be given to several important factors before attempting the removal or devitalization. First, no tooth with a vital pulp can be properly prepared for a crown without endangering the life of that pulp, and at the same time subjecting the patient to extreme pain and inconvenience. But if we remove the pulp, we must remember that Dr. G. V. Black has repeatedly demonstrated that pulpless teeth are one-third less powerful than live ones; and Dr. Thos. L. Gilmer is authority for the statement that one person in every four, with pulpless teeth, has an abscess, and may not know it; the pus may be draining off through the system, infecting other parts of the body, without in the least manifesting itself in the neighborhood of its origin. This, with the knowledge that we have recently been acquiring relative to systemic disorders due to local foci of infection, particularly in the teeth, should make us very cautious about destroying vital pulps unless we can at the same time be reasonably certain that we can produce a root filling as nearly perfect as human skill can make it.

In the second class—hyperemic and inflamed pulps—conditions are somewhat different. Those with active hyperemia may possibly be treated and saved, but if the condition has progressed into passive hyperemia or inflammation, it will be necessary in practically every case to remove the pulp. Under these conditions we are generally spared the responsibility for the life of the pulp, but the responsibility for the root filling and future service of the tooth rests just as much upon the dentist as in the preceding class.

With dead pulps there is of course no question about their removal. They must be removed, and removed thoroughly and with the utmost care that further complications are not produced. In cases in which there is pus in the coronal portion with the apical ends of the pulp still vital, some difficulty may arise in attempting their removal, but this can usually be accomplished with little pain by first washing out and removing mechanically all of the pus and dead pulp down to the vital ends, and sealing in for three or four days beechwood, creasote or some phenol preparation like Dr. Buckley's Phenol Compound composed of phenol, thymol and menthol. Never seal arsenic on these pulp ends, on account of the close proximity to the apical foramina, and therefore the danger of its passing through into the periapical space and producing destruction of the surrounding tissue.

Upon opening the tooth again under aseptic conditions, frequently all the pulp may be removed painlessly, but if there still be some sensitiveness, a little phenol on a smooth broach or a broach with a few threads of cotton wound upon it, may be worked alongside of the pulp to the apical end. Follow this with a barbed broach and remove the pulp generally with little or no pain.

In removing gangrenous pulps, during the first treatment the chief concern is that no infectious material be forced through the apical foramen; in fact it is better not to attempt the complete removal at this time, but only such part as may be removed easily. A treatment of creasote sealed in for three or four days will so sterilize the remaining pulp that it may be thoroughly removed at the next sitting. Another treatment of creasote should complete the medical part of the treatment ready for filling.

I know that many of you are ready to ask about formocresol in these cases, and that I may not have to include that in the closing discussion, will say that formocresol is a most excellent remedy when properly used, and a frequent cause of sore teeth unless careful attention has been paid to detail in its application. Formocresol must have putrescent material to work upon, that the formaldehyde gas may be neutralized. Therefore if there be no putrescent material present to neutralize the expanding formaldehyde gas, it will pass through the apical foramen and irritate the periapical tissues, causing tenderness and soreness. It is necessary then that there be a thorough understanding of conditions present, and a close adherence to detail in its application, for the successful use of formocresol. The failures with formocresol have resulted from its use in cases where it was contra-indicated, and it was therefore the dentist, and not the drug, that was at fault.

The treatment of abscessed teeth has been so thoroughly discussed that I shall make no attempt to reopen the subject at this time, but simply name it because it is one of the previously mentioned pulp conditions to be taken care of before proceeding with the root canal filling.

It is absolutely impossible to do perfect work in any branch of dentistry without good access thereto. The gold foil worker would not think of undertaking the insertion of a filling until he had secured the best possible access to his work. The gold inlay demands perfect access, not only in the preparation of the cavity, but in the removal of the impression and the insertion of the finished piece. No attempt would be made to insert a porcelain inlay, or an enamel filling, unless the best possible access had been secured; but when it comes to pulp removal and root filling, a large percentage of them are attempted around a corner, behind a wall, or under an overhanging ledge that could just as well as not have been removed, and frequently is removed later to accommodate the filling after having interfered seriously with the work.

It is of the utmost importance that good access, not only to the pulp chamber, but into the root canals as well, be secured at the very beginning of the work before attempting to remove the pulp; then all succeeding work will be facilitated. Overhanging walls that interfere in any way with direct access to the canals, must be removed that we may have an unobstructed view, and that instruments may be passed directly to and into the canals for the removal of the pulp and for the subsequent root filling. It is true in many cases that in order to accomplish this, much sound tooth structure must be sacrificed, but it is far better to make a somewhat longer restoration under favorable circumstances, than a much smaller one over an imperfect root filling due to a lack of proper access thereto, with the probable subsequent trouble and possible loss of the tooth. To get access to the apices of all root canals is rather a high aim, and the best of operators will frequently fail to reach that degree of perfection. Not that it cannot be reached, but that they are not willing to devote the necessary amount of time and labor to accomplish it. Many serious difficulties present themselves in the cleansing of small tortuous canals that cannot be overcome by ordinary methods. In these cases we must resort to enlargement.

For the enlargement of small canals, many methods have been advocated—broaches, drills, acids, etc.—but of all these there is but one safe and sure way, the barbed broach. Many canals are so small that the finest barbed broach will not enter them. In such cases a smooth broach may be used. It can be roughened by rolling it between a file and a piece of hard wood, and by inserting it into the canal and withdrawing it several times there will be room for the smallest barbed broach to enter; or if not for that, a fine barbed broach that has been used before and the barbs partly worn off may be sterilized and used a few times before the new sharp broach will enter. Then by withdrawing the broach, inclining it in turn toward all sides of the canal several times, the smallest canal will be enlarged sufficiently for treatment and the reception of a good filling. Barbed broaches should never be rotated in small root canals, but should always be inserted and withdrawn with lateral pressure, thereby filing away the sides of the canal.

The use of acid for the enlargement of small canals is contraindicated because we have no way of knowing the extent or direction of its action. It will not follow a canal filled with soft tissue or debris, unless forced there, and forcing it with soft rubber is apt to cause it to penetrate the foramen with disastrous results. To work it into the canal with a broach is not feasible, because the acid will corrode a steel broach and probably cause it to break off in the canal, and a canal that will admit a platinum broach large enough to be rigid, would not need enlarging. Drills fine enough to be of service in opening small canals are too delicate to stand the rotating, and break off in large percentage of the cases in which their use is attempted. This leaves us but one way, that of the barbed broach, but since it will work in every case that can be done at all, it is sufficient for our purpose. Try to master the technique and you will have far less poor root fillings to regret in the future.

After the removal of pulps by whatever method, and the enlargement of small canals, all root canals should be treated with an antiseptic dressing for a few days, and while this is opposed to the theory and practice of many good operators, I still protest against immediate root filling except in most extreme cases where a subsequent sitting cannot be had.

THE TECHNIQUE OF ROOT CANAL FILLING.

All the materials and instruments needed for the filling of the root canal should be prepared and placed conveniently at hand before commencing the work of filling. This is imperative because of the impossibility of maintaining aseptic conditions during the progress of the operation, if the dentist has to search through the cabinet or about the office for some missing instrument or material, thereby bringing to the work new forms of infection.

Asepsis is one of the great points to be constantly borne in mind during the process of root filling, for it is effort wasted to exert care in the treatment of the root canal to render it sterile, and then fill it with septic or infected material, whether it be in the material itself, or conveyed to it from the instruments or from the hands of the operator.

The value of sterilization of instruments is pretty well known, but the necessity for the care of the hands, I believe, is much less clearly understood. Too many dentists wash the hands when the patient comes in and no more attention is given to them until the arrival of the next patient. In the meantime they have adjusted the chair and head-rest, opened most of the drawers of the cabinet—none of the knobs of which have been sterilized since we don't know when—have touched almost everything in the office, and have even in some rare cases collected and fondled a filthy dollar bill that someone has been kind enough to bring in on account, after which they pick up a gutta-percha cone, stroke it to straighten the point, and place it in the root canal that has taken a week or more to clean and sterilize; and then we wonder why that tooth later on develops an abscess.

You may say that the dentist cannot work like the surgeon in the hospital operating room where he is surrounded by assistants to care for all these details, and hand him the sterilized instruments as he needs them. That is granted, but he can do much more than he does do. He can sterilize the fingers frequently during his work, and especialy before he touches anything that goes into the root canal after it has once been sterilized.

My plan is to have on my bracket-table a small jar filled with an antiseptic solution, and for this purpose I use cyanide of mercury; and frequently during the operation, and especially after I have touched anything that might be unclean, I take a piece of cotton in the pliers, dip it into the solution, and pass it to the fingers of the left hand, squeeze it partly and pass it to the fingers of the right hand and squeeze it again, dry the fingers on a napkin, and I know that they are at least reasonably clean to wrap cotton on a broach or whatever other work they may have to do. This takes but a second or two and is really effective; certainly much more so than a sterilizer with large letters, kept on exhibition in front of the patient, and never used.

The gutta-percha cones, as they come from the manufacturer, are not suitable for use in root canals. They are made either by hand or machine, with little or no attention being paid to their sterilization, and even if they were sterile when made, they will not long remain so if allowed to lie around in an open box in the cabinet. Infected cones are a very common means of infecting the tissues in the periapical region, thereby producing alveolar abscess. To avoid this cause of trouble, sterilize all cones when you buy them by placing them for ten minutes in 95 per cent alcohol, dry on aseptic gauze, and place in large sterile gelatin capsules or small glass vials, ready for use when wanted. The advantage of the capsules or the glass vials is that the cones may be seen without opening the container, the proper size selected and then removed with pliers, without exposing the rest of the cones to more of the germ-laden atmosphere than is necessary. Cut off the sharp point of the selected cones and place them in a small dish containing 95 per cent alcohol until ready for use.

Cotton is another means of infecting root canals if proper precautions are not taken to keep it in an aseptic condition. The cotton as it comes from the manufacturer in cartons is usually aseptic, but it will not long remain so if kept in open containers on the bracket-table or in the cabinet. It should be kept in some form of container with tight fitting cover to protect it from the air when not in use.

The use of the rubber-dam in the filling of root canals is of the utmost importance. The necessary asepsis cannot be established and maintained by any other means at our command. Before adjusting the rubber-dam all debris should be removed from between and around the teeth, and the gums and teeth swabbed, flushed or sprayed with a pleasant antiseptic solution. The dam is then placed over the teeth and ligated. The teeth and dam are now washed off with alcohol before the temporary filling covering the last treatment is removed. It is very important at this time that all instruments used be sterile; that the operator's hands be in an aseptic condition; that the cotton used in the root canal be aseptic; in short, that everything that touches the tooth or goes into the root canal from this time on, be sterile. With these conditions present, we are ready to remove the temporary filling and treatment, and proceed with the root canal filling proper.

Upon removing the treatment, carefully go around the walls of the canal with a sterile barbed broach to be sure that no remnants of cotton or other material be adhering thereto. Bathe the canal with 60 per cent alcohol on cotton wrapped on a smooth broach, and absorb with dry cotton on a broach, or evaporate with warm air.

A word of warning regarding the use of electric and other root canal dryers may not be out of place. I believe that it can be safely said that more damage to the tooth structure and peridental membrane has been caused by over-dehydration than by too little drying in root canal treatment. It is not dehydration that we want at all, but simply the removal of surface moisture. This is also the great objection to the use of 95 per cent alcohol in root canals. Alcohol in this strength has a great affinity for water, and abstracts it from the dentin, thereby weakening the tooth structure in much the same manner as is done by the electric or other root canal dryers when excessive heat is used. In 60 per cent alcohol the affinity for water has been satisfied to an extent, and the resulting action is that of a mild antiseptic with slight drying action, instead of that of an active dehydrant.

For lubricating the dried canal previous to the insertion of the gutta-percha cones, eucalyptol is superior to any other agent because it is a slight solvent of the gutta-percha cone, allowing it to slide along the walls of the canal, and later upon being absorbed by the dentin, forms a cementing substance of eucapercha between the cone and the walls. Eucalyptol is antiseptic and non-irritating, so if by chance a slight amount of it be forced through the foramen, no unpleasant symptoms need be anticipated.

Eucapercha, or Dr. Buckley's Eucapercha Compound, which is a solution of white baseplate gutta-percha in eucalyptol to which has been added 3 per cent menthol and 5 per cent thymol, may be used as a lubricant, especially in small canals, followed by a fine cone with a pumping motion to force it as near the apex as possible. The eucapercha is superior to chlorapercha because it does not dry up so quickly with the subsequent shrinkage so common in the latter.

After the canal has been lubricated with eucalyptol or eucapercha as the case may demand, a section of gutta-percha cone not more than 3 millimeters long and of a size corresponding to that of the canal, is attached to a heated plugger and allowed to cool. It is then dipped in eucalyptol and carried into the canal, and forced as far as it will go. The plugger is then removed, warmed, and again passed into the canal and more condensation of the gutta-percha secured. Other short pieces of cones are attached to the plugger and carried into the canal and condensed until the canal is completely filled. Any excess in the pulp chamber is then removed with a heated ball burnisher, which at the same time seals over the mouth of the canal.

The pulp chamber may either be filled with cement or left as a place of anchorage for the filling, as the case may demand, but should never be filled with gutta-percha, its slight yielding property making it unsuitable as a foundation for a filling or inlay.

While it is advisable to have the material used for filling root canals medicated to the degree of being antiseptic in character, it must be remembered that there is no such thing as "permanently antiseptic root canal filling material." In recent years too much dependence has been placed upon this supposed and extensively advertised property. No material should be used in this work that cannot be made to fill the canals completely and thoroughly, and any material that does not comply with this requirement should be discarded.

When the dental profession fully recognizes the importance of thoroughly treating and completely filling root canals under as nearly aseptic conditions as possible, a long step in advance will have been taken, especially in the prevention of local foci of infections in the mouth as a cause of various systemic disorders.

SOMETHING ON ORAL PROPHYLAXIS.*

BY F. H. SKINNER, D. D. S., CHICAGO, ILL.

"Prophylaxis" is the method of prevention of disease, i. e., the guarding against disease. The practice of *oral* prophylaxis means the carrying out of the highest ideals of dentistry, and pyorrhea is only one step farther in instrumentation. They are both more strenuous work than the usual procedure in prosthetic dentistry, and require patience, delicate manipulation, one's intelligent application of his knowledge of the work, and the confidence and co-operation of the patient.

The first step in securing the confidence and co-operation of patients is to educate them to appreciate what we are doing sufficiently to cause them to give all the home care necessary to complete our work. Every dental office should be a little centralizing school of dental education. When out of the office, unless approached on the subject of dentistry, it does not seem good etiquette to bring the conversation around to that subject, but when patients are in the operating chair, it is not only good etiquette, but it is our duty to talk on that branch of dentistry which will be beneficial to them. Some grasp the big ideas on oral prophylaxis quickly, but it is hard to interest others, and in the latter case, it requires tact to bring home the realization that you are striving hard to better their condition and not working for the monetary consideration. Securing this interest is the ground work for future co-operation between patients and dentists.

SOME ETIOLOGICAL FACTORS OF PYORRHEA.

Pyorrhea is caused directly by infectious substances lodging and remaining on the tooth surfaces themselves. There are a great many causes which lessen the resistance of the soft tissues and bony support of the teeth, thereby making it possible for local infection to take place. The most prominent of these I consider malocclusion, which is due to many causes. In some cases, normal occlusion can be obtained only by orthodontia. When cusps articulate with portions of the teeth other than those designed for them by Nature, they produce an unnatural force which bruises the peridental membrane. In the mouth of the average person who has reached thirty-five or forty years of age, some portions of the teeth have worn down more rapidly than others, and the portions not worn down usually cause a side pressure on the opposing teeth, thus injuring the peridental membrane and causing absorption of the process or else forcing the teeth apart at the contact points, which allows fibrous foods to impinge on the crest of the gum septum. Some other causes of irritation which reduce resistance are imperfectly formed enamel surfaces or those which have become etched from accumulations being left upon them until acid fermentation has taken place; fillings improperly finished at the gingival margins or fillings which cannot be made smooth, such as all the phosphates and some of the silicate cements; banded crowns and regulating appliances, which cause a great deal of irritation, if carelessly fitted, and bands which fit, but which have been driven up until they impinge the peridental membrane.

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*Read before the Kenwood Branch of the Chicago Dental Society.

When the first permanent molar has been extracted, there is a tendency for the space to become closed and for the opposing teeth to elongate. The teeth posterior to the space come forward as a result of the pulling on the fibers due to the formation of scar tissue where the tooth was drawn. In a short time, malocclusion produces a force which causes the remaining teeth to tilt still more, and in a few months, most of the stress of mastication is brought to bear on the under side of the tilting tooth, bruising the peridental membrane at this point. Here also is usually found an accumulation which is a source of infection to the already injured tissues, and pyorrhea results. Unless the full space is maintained by the proper interlocking of the cusps of the remaining teeth, I believe it is perfectly legitimate to cut into the tooth at each end of the space and insert a bridge, preferably of the spur and inlay type. This method of making a short bridge maintains the space and occlusion and yet allows a little movement of the teeth in the alveolus without the danger of loosening the inlays. I do not believe in devitalization when it can possibly be avoided.

THE TEETH AND THEIR SUPPORTING TISSUES.

The dentin of a tooth is filled with tubules, which, in the crown, extend to the inner portion of the enamel, and in the root, to the cementum, through which small foramina occasionally penetrate and connect with the peridental membrane. These foramina are usually in the apical third. The outer portion of the cementum has a rough, pitted, irregular surface to which the peridental membrane and dental ligaments are very firmly attached. The cementum next to the dentin is formed first and is more dense than the outer, or newer, layers, because the old lamellae are more completely calcified.

The alveolar process is formed around the teeth as they erupt. It is very porous, spongy, has thin edges and is somewhat of an insecure framework for supporting the great stress of mastication brought to bear upon it. The teeth are suspended in these sockets by dental ligaments, some of which run obliquely upward, forming a sort of hammock and are attached to the process by fibers which spring from the cementum and appear in bundles. The cementoblasts build up the layers of cementum, and then calcify both the latter and the fibers, which, in this way, become attached very firmly to the root surfaces. A short distance from the surface of the root, they usually break up into smaller bundles which anastomose and interlace, passing around blood vessels and other fibers and being again united into large bundles for attachment at their other extremity. These bundles of fibers, or ligaments, gain very firm anchorage in the alveolar process, and some bundles, gingivally to the crest, pass from the proximal side of one tooth to the proximal side of the adjacent tooth. Through the mucous membrane and vessels which pass through the alveolar process, the peridental membrane is supplied very plentifully with blood. The blood vessels pass over the edge of the tooth socket, as well as through the process, and permeate the peridental membrane.

SUSPECTED AVENUES OF INFECTION.

There are certain glandular structures in the peridental membrane which have been beautifully described by both Black and Talbot. These glandular cells, also called epithelial cells, are in direct connection with channels leading into the mucous membrane and alveolar process. Any infectious material on the teeth or accumulating between the teeth, at the free margin of the gum, has an uninterrupted avenue of entrance into the deeper structures. Micro-organisms, introduced into the tissues through pyorrhea pockets or blind abscesses, when not taken care of by leucocytes and antibodies, travel uninterruptedly to where they are taken up by the circulation and distributed to points of lessened resistance, where they form colonies, and according to location, produce different diseases.

The absorption of micro-organisms and their circulation in the blood stream, into which they are introduced through the tissues surrounding the teeth, are, today, considered responsible for many diseases. The micro-organisms are carried by the blood stream to the joints, heart, kidneys, or other organs, where they produce destructive changes which were unaccounted for, for a great many years. Research workers have compared the bacteria taken from tooth surfaces, their surrounding tissues and apical abscesses with those taken from remote parts of the body, and found them apparently identical. In fact, it is known that bacteria are selective in the tissue which they inhabit. Those taken from an apical abscess of a patient with a diseased heart and injected into lower animals, usually, if they fertilize at all, select the heart tissues for their habitation. We have had many instances of cultures of bacteria, taken from blind abscesses or pyorrhea pockets and injected in rabbits or guinea pigs, producing the same pathological conditions in the animals as those from which the patient was suffering. The extraction of abscessed teeth and the treatment of ill kept mouths have been very helpful in clearing up many obscure pathological conditions.

TREATMENT OF PYORRHEA.

Up to four years ago, the most successful pyorrhea treatment was the thorough removal of all deposits, necrotic peridental membrane and outer surface of the cementum, down to the dense layer. This was followed with the best polishing possible and then with maintained cleanliness. In 75 per cent of the cases, if the work were properly done, the congestion would disappear, and the swollen tissues would recede to where the peridental membrane was attached to the teeth. Usually, by the slight proliferation of bone cells and the formation of scar tissue, the teeth were held very firmly for years. If prophylaxis were kept up, a reinfection of the tissues was not liable to occur.

In nearly every case, it is possible to stop suppuration and produce health in the surrounding tissues, but it is necessary to splint or anchor all loose teeth in order to maintain a healthy condition. In these cases, some form of splint must be used which can be kept clean and which will not irritate the soft tissues. In extensive cases where a number of teeth have been lost, some form of removable bridge work which forms a positive splint is absolutely necessary. Those of you who heard Dr. Knoche's paper, read before the Chicago Dental Society last November, heard the outline for one of the best means of saving a patient from wearing a plate and of splinting a few remaining teeth in badly broken down mouths that has ever been given the profession. I believe the time will come when those working for the best in dentistry will do away with all forms of extensive, fixed bridges.

Since the introduction of the Dunlop vapor, the procedure in the treatment of pyorrhea has differed somewhat, and now I am combining this vapor treatment with the use of the planing instruments and the cupping process.

A great many patients whose mouths show no inflammation at the gum margins have osteitis or osteomyelitis, which result in the disintegration or absorption of the alveolar process. Red or cyanotic areas high up on the gums indicate diseased conditions and lowered vitality, and in periods of cessation of oral prophylaxis, the result is infection, suppuration and pyorrhea. The Dunlop vapor, if understood and properly applied, will reach these diseased areas. If recognized in time, the development of pyorrhea can be prevented by establishing oral prophylaxis, eliminating all irritation and building up Nature's resistance by the use of the vapor.

In the treatment of advanced cases of pyorrhea, I first remove all deposits and stains from every portion of the tooth not covered by the gums, and polish all roughened, etched or undeveloped enamel surfaces. This sometimes requires several sittings. This scaling and polishing should be carried a millimeter or two under the free margin of the gums, but at this time, I do not attempt instrumentation in deep pockets. Crowns, bridges, improperly finished fillings, unsavable teeth, or any other irritant present must be corrected or removed. Poor contact points also must be corrected. If there are fillings which lack contact points, I frequently drill cavities in them and pack with base plate gutta percha. This gradually gains space between these teeth and forces the other teeth together, thereby re-establishing close contact points between the other teeth. When sufficient space has been obtained, well contoured fillings with good marginal ridges and fissure restoration should be inserted, and any cusps which interfere with proper occlusion should be ground. I especially speak of marginal ridges and fissure restoration, because so many fillings, instead of being built up with marginal ridges and fissures, are inserted with flat surfaces which slope toward the contact point, thus producing force which tends to separate the teeth. Nature normally provides a high ridge near the point of contact, which forces the food toward the occlusal fissures, and unless we follow out this thought in our repair work, there is sure to be trouble sooner or later.

DUNLOP VAPOR TREATMENT.

At the first sittings, the Dunlop spray is introduced into the pockets by using the nozzle without the needle. At the following sitting, it will be noticed that considerable inflammation will have disappeared, and the patient says his mouth feels better. Then I begin using the Dunlop vapor treatment, which consists of introducing borated oxygen gas into the tissues, through little openings in the inner wall of the gingivae, by means of a very delicate, blunt needle. By passing the needle just under the free margin of the gums, and then bearing outward a little, the vapor will find little openings in the soft, detached tissues. One will be surprised to see the distance the vapor will penetrate in inflamed areas. The needle should never be allowed to puncture the tissues, nor should it ever be carried to the bottom of deep pockets, or used against tissues where new granulations are beginning to form, because if we once break up or blow out newly granulating tissue, fresh granulations will have great difficulty in reforming. Ordinarily, a vapor treatment is given every day for five days, with an intermission of from five to seven days before another series of treatments is started, because of the formation of new tissue cells, and it takes several days for them to become permanently fixed so as not to be injured by the entrance of the vapor through the tissue. The vapor should always be introduced into the more healthy areas and allowed to penetrate through them to the diseased portions. In some cases, the vapor seems to have little or no effect, except to reduce the inflammation and make the patient's mouth much more comfortable. After a couple of weeks of vapor treatment and cleanliness, if suppuration has not ceased, I begin surgical treatment of the roots, but in all cases, I try not to detach any of the fibers of the peridental membrane, for I am working for their re-attachment. This vapor has an affinity for diseased tissues, traveling only in those undergoing inflammatory changes, and it is surprising to see how far it will penetrate. I have introduced the vapor in the region of a cuspid, seen it travel through the tissue and come bubbling out around the neck of a third molar. When introduced at a bicuspid on the right side, it has crossed the median line and come bubbling out around the bicuspids on the opposite side. When introduced between the buccal roots of an upper first molar, it has penetrated down into the tonsil or up into the forehead, showing that there are channels actually extending from the inner wall of the gingivae into the deeper tissues in any direction. It cannot be forced into healthy tissue. Red or cyanotic areas located on the gums, well away from the teeth, indicate osteitis or osteomyelitis and can be reached by the Dunlop vapor, when properly applied. It establishes more comfort for the patient, produces hyperemia and apparently stimulates circulation.

To prevent re-infection during the healing process, I want to go over my patients' teeth with a polisher once or twice a week, or have them do so. A couple of weeks should elapse before instrumentation in the deeper pockets is started. The vapor stimulates circulation and reduces inflammation, and occasionally, deposits seem to soften so that very little pressure will detach them from the teeth. In these cases, I expect a true union of the tissues to the root surfaces, because all the connecting fibers are not necrotic.

Dr. Loeb in his book "The Mechanistic Conception of Life," says: "Life of warm blooded animals, man included, ends with cessation of oxidation in the body. As soon as oxidation has ceased for some time, the surface films of the cells, if they contain enough water and the temperature is high, became permeable for bacteria, and the body is destroyed by micro-organisms." We cannot think of a more favorable place for the breaking down of tissue cells than is found in the alveolar process and gum tissues, where there is moisture, body temperature, lack of oxygen and poor return circulation. The Dunlop vapor furnishes oxygen to these congested parts, promotes normal cell activity and, thereby, growth. The hemoglobin of red cells absorbs oxygen wherever it can get it. The vapor immediately restores the bright red color which oxygen gives to blood and stimulates circulation, thus supplying food upon which the newly formed cells exist. By pressure, it forces micro-organisms and their toxins out into the healthy tissue, where the leukocytes have an opportunity to combat them, and wherever it carries these micro-organisms, it also places the borated oxygen vapor, which produces active hyperemia, thereby adding to the vitality of the parts. This, if not carried too far, should have the effect of an autogenous vaccine, thus raising the vital resistance against infecting organisms. In some cases, the use of the vapor apparently causes no change in the deposits or their attachment to the teeth. In these cases thorough instrumentation is indicated.

INSTRUMENTS.

A good many of the so-called pyorrhea instruments on the market would make better gouges and chisels than dental instruments. A great many men fall down in pyorrhea work on account of the selection of instruments which are not delicate enough to do the work and which are improperly shaped. Some men lack the ability to recognize small deposits which form usually on the proximal surfaces just under the gingivae, recognizing pyorrhea only in its advanced stages. More depends upon the man than on the instruments, but any man will do better work with properly designed instruments which he has learned how to handle, than he will with certain classes of instruments which have been forced upon the profession for years. The planing instruments are in a class by themselves. I do not advise anyone to purchase a set of planing instruments, without taking a course in learning how to sharpen them, how to keep them in good working order and how to handle them. Next to the planing instruments, I would recommend something on the order of the

Younger set, but with these, it is frequently necessary to use local anesthetics hypodermically. These sometimes produce soreness of the tissues, which may last from a few days to a few weeks. I do not believe that the tissues ever recuperate as quickly after the use of hypodermic injections, as they do without them. From the histology of the tooth, one can readily see that an instrument which removes a very thin, delicate shaving and leaves a smooth surface should be used. This we can do only with the planing instruments, for they cannot be made to cut deeply, and they are adaptable to any shape of root or surface, except in the sharp angles where roots bifurcate. There, an instrument of the Younger type is preferable. Where the planing instruments have been used, soreness usually leaves the soft tissues in less than twenty-four hours. Soreness, which lasts from twenty-four hours to a week, more often results from the use of other instruments. In some cases, where tissues have been badly lacerated from the use of improper instruments in pyorrhea work, I have known of patients who have been laid up in bed from anaphylaxis, or the hyper-susceptibility to the action of toxines, introduced into the tissues and absorbed. The planing instruments are shaped so that they extend to the bottom of the pocket and yet cause very little laceration of the tissues.

All etched or roughened enamel surfaces adjacent to soft tissues must be made smooth and polished. Then all deposits should be removed, and the necrotic peridental membrane and the irregular outer surface of the cementum should be planed to the dense layer. This is absolutely essential where the soft tissues do not become united to the peridental membrane and close the pocket, because millions of pathogenic bacteria will propagate in the dead peridental membrane and other debris which adheres to the irregular, pitted surface of the cementum. Leukocytes form a very dense wall, which, in a large measure, protects the soft tissues from the infection of micro-organisms. Leukocytes possess ameboid movement, but they are unable to cross over from the soft tissues to the infected root surface in sufficient numbers to cope with the millions of bacteria which grow on improperly cared for tooth surfaces. The leukocytes in the soft tissues adjacent to pyorrhea pockets gradually die, and, in connection with fragments of disorganized tissue, are thrown off in the form of pus. Therefore, when thorough instrumentation proves necessary, it is absolutely essential that all root surfaces, where the peridental membrane has lost its attachment, should be planed to a smooth surface, but care should be taken not to go through this dense layer of the cementum, for just underlying it is tissue, which, if exposed, becomes extremely hypersensitive, and it is also a much more favorable area for the propagation of bacteria than the hard, smooth layer of the cementum.

With proper instruments, it is not difficult to tell when one has reached the hard surface, and a skilled operator will stop working on that surface the minute he has reached it. In planing off lime salt deposits, the feeling transmitted to the hand of the operator is that of the instrument scraping over unpolished marble. In planing off the necrotic peridental membrane, the sensation is that of pulling the instrument over plush or velvet. A few strokes will remove this, and then we come to a rough, bony like surface. With a few strokes of a sharp instrument over this surface, the sensation is that of rubbing a burnisher over polished ivory. This is the time to stop, for we have reached the hard layer which lies just under the rough surface of the cementum. If we are unfortunate enough to plane through this layer, the instrument will begin to jump. This will indicate that we have planed through and have done as much damage as good. After the work has been properly done, if the patient should be negligent about his mouth and deposits should form again, instruments which do not cut should be used on the surfaces which already have been planed, for we do not want to take any chances of cutting through this hard layer. The little files designed by Drs. Smith, Tompkins, Hartzell and several others may be used at this time, and I also wish to make special mention of the extremely delicate files designed by Dr. Hutchinson and manufactured by Mr. Grafrath of New York. Files soon lose their edge, thus eliminating the danger of cutting too deeply, yet they will remove deposits from this hard layer.

About 75 per cent of the cases of pyorrhea can be cured by the thorough removal of all deposits and other causes of irritation. The Dunlop vapor will add 20 per cent to this, and I believe, where it has been used as heretofore described, and where some of the fibers still retain their vitality, the attachment of tissue will take place much nearer the necks of the teeth, and less instrumentation will be required to obtain good results. The other 5 per cent which do not respond readily to these treatments are usually complicated with some systemic condition, which results in a general lowering of the tone of the whole body. Diabetes, Bright's disease, intestinal toxemia, absorption of pus from other parts of the body, anemia, and in fact, any of the slow, chronic, debilitating diseases will help to retard a rapid recovery. Often, in cases of this kind, oral conditions will respond immediately upon correcting the systemic disorders, but more often, the systemic disorders, themselves, are corrected when the oral cavity is put in a hygienic condition and cleanliness is maintained.

Vaccines have proven of value in some cases, but I believe when a vaccine is used, it should be an autogenous vaccine.

There is a form of suppuration which is frequently mistaken for pyorrhea, and for which one should always be on his guard, that is, where an apical abscess has opened along the side of a root, and is discharging at the neck of the tooth. These cases sometimes resemble pyorrhea where the gum hugs the neck of the tooth so closely that the pus burrows up or laterally, into the process. Sometimes they will respond to vaccine and vapor treatments, but it is usually necessary to open the gum over a cyst, located by an X-ray, curet all necrotic and carious bone and plane the root thoroughly, as you would in a peridental abscess; then pack with gauze and euroform paste to make the opening heal in from the bottom. We do not always get the results we hope for from this treatment, but it usually stops the destruction of bone and will make the tooth useful for a number of years.

HOME CARE.

Patients should be informed that pyorrhea is the result of debris which has been allowed to form and remain on the tooth surfaces. They should also be told that they shall have to work harder than ever before to maintain a healthy condition after their pyorrhea has been cured, and that this cure can be maintained permanently only with their co-operation, because the same cause will produce the same result again.

Within three or four days, after clean surfaces have been obtained, accumulations will begin to gather again. After painting a patient's teeth with the disclosing solution and rinsing, it is well to let him see how soon infectious accumulations, as evidenced by the stain, have gathered on the teeth. When the vapor treatment is used, it is well to give it before and not after the disclosing solution has been applied, as certain of the medications stay on the tissues, and we ought to avoid forcing them in more deeply. I also try to avoid getting the disclosing solution onto silicate cement fillings, porcelain inlays and jacket crowns, because the iodin combines with the metallic portion of the cements, thus causing their discoloration and disintegration. I believe the greatest service a dentist can do his patient is to teach him how to take care of his own mouth, because it is the regular home care in maintaining cleanliness, in connection with the periodical professional prophylaxis treatments, which keeps his mouth in a healthy condition. In order to prevent reinfection, it is essential to keep this bacterial flora from gathering on the tooth surfaces. The patient is provided with a kuroris, or cotton carrier of some sort and a supply of cotton rolls. I prefer the kuroris, because it is especially adapted for this purpose, and the handle end can be used as a tongue scraper. He is also given a polisher, dental tape and mouth mirror, and a good many patients even wish to use the disclosing solution.

It requires a great deal of persistence to teach some people to use this outfit, while others take to it very readily. A dentist must be able to keep his own mouth clean before he can be successful in instructing patients. I do not believe that we have the ability to induce our patients to do that which we are not able to carry out ourselves, and I always feel that a man, who is giving advice to patients which he is not carrying out for himself, is not really sincere. Patients feel this, and his arguments lack force, if he is not actually doing the work for himself.

Until the teeth are smooth, and while new tissues are forming, I do not advocate vigorous rubbing of the gums with the cotton rolls or brush, because, if the tooth surfaces are not smooth, rubbing the gums intensifies the irritation, and if new tissue is forming, we are liable to destroy it and, thereby, arrest the repair work; also the formation of new bone cells around the teeth is restricted by the hastened contraction of the tissue around the necks of the teeth, as a result of hard rubbing, but the tooth surfaces, themselves, should be kept clean by the use of cotton rolls, cheese cloth napkins or wooden points. The proximal surfaces should be cleaned with tape, and a reasonable amount of brushing immediately after each meal, and the use of the dental tape will remove most of the loose debris which accumulates.

The tooth brush, in a large measure, is a failure in preventing decay and pyorrhea, but I am not quite ready to eliminate it as a toilet article, although I am somewhat particular as to how it is used. Too gritty a powder, which will wear away the teeth, should be avoided. Pricking and stabbing the gums with the bristles of a tooth brush should be watched for and stopped, for tooth brush bristles always carry infection, and injured places on the gums form points of entrance for infecting organisms, and later will result in scar tissue, which contracts, thereby starting the gums to recede. Small brushes are preferable to large ones. Have patients practice brushing before you, until they have learned to handle a brush correctly. They usually form a habit of commencing to brush in one place, which is usually at the gingival margin of some of the anterior teeth. This can be detected in its early stages by a slight recession of the gums above the tooth or teeth where the brush is first placed. Later on, this cannot escape our notice, because the gums will have receded, and grooves, of a greater or lesser depth, will have been cut in the teeth. Frequently, patients will tell you this is erosion, but this kind of erosion stops when the gums are put in a healthy condition, and the patients are restrained from using gritty tooth powders and beginning their brushing at that point. Should the gingival margin of this groove be sharp, it should be rounded off, otherwise it will cause irritation if under the gingiva. The chief benefits derived from the use of a tooth brush are that it acts like a series of fine tooth picks, thereby removing a part of the loose debris, and that the massaging produces a more healthy condition of the gums, but massaging the gums can be carried to excess. I do not like to see gums present a hard, leathery, mottled, light pink surface, for this calloused appearance is the result of severe rubbing. There is not good circulation there, and serumal deposits usually gather, sooner or later, and work root-wise under this kind of tissue. Gum tissue should lie over well formed bony structure and should have a good, bright, healthy color and a net work of fine capillaries showing plainly just under the surface. I do not mean hyperemia, but just a good healthy circulation. As far as I have been able to observe, daily massaging with cotton rolls or cheese cloth napkins increases circulation, but does not cause the gums to become calloused. It is better to take tooth brushes away from patients, if they cannot learn to handle them properly, and have them depend upon the polisher, dental floss and cotton rolls, for with these instruments they will not injure their teeth or gums.

With the aid of a looking glass and a small mouth mirror, a patient can see foreign substances on his own teeth, by applying the disclosing solution. Polishing with wooden points will remove all soft accumulations located by the disclosing solution. When necessary, patients are allowed to use an abrasive, such as Pepsodent paste, precipitated chalk or a fine silex preparation. I have not used pumice stone in my practice for more than six years, because it does not polish highly enough to inhibit the formation of bacterial plaques.

Some patients are able to maintain clean tooth surfaces for six months or longer, while others, who will not try or who have not the ability, need to have a prophylaxis treatment every thirty days. We must find out how long they are able to keep their mouths in a clean, healthy condition, and then establish that length of time as a period for prophylaxis treatments. In this work, it is necessary to notify patients when they are due, and when informed of the plan used for keeping in touch with them, they invariably wish to be put on the "call-up" list. There are many things about so-called oral prophylaxis which do not coincide with the theories of some of our research workers, but clinically it certainly maintains a more healthy condition than any other method of treatment ever used in the oral cavity. Clinical results are convincing and are what we are after.

In his book, "The Prevention of Dental Caries and Oral Sepsis," Dr. H. P. Pickerill criticizes the polishing of the tooth surfaces for fear of mechanically removing Nasmyth's membrane through which, after the eruption of the teeth, he claims the outer layer of the enamel is being constantly calcified. The Nasmyth membrane theory, I believe to be a fallacy, because this membrane from which the enamel is formed wears off within a few months after the eruption of the tooth. There is very little question, when the teeth are placed in a proper environment and oral prophylaxis is maintained, that the outer surface of the enamel becomes much harder. A few weeks ago, I had the privilege of going through Dr. Bunting's laboratory, in the University of Michigan, where he is carrying on a great deal of experimental work. He doesn't know how it takes place, but is satisfied that the teeth which have been given monthly prophylaxis treatments for a year or more have a very much harder surface than teeth which have been ground and brought to that same polished surface at one sitting. He has arrived at this conclusion by comparing the depths to which silver nitrate penetrates the enamel of the two. The theory is advanced by some that this is accomplished through the condensation or compression of the enamel rods from the mechanical rubbing of the outer surface of the tooth. To me this hardly seems feasible. According to Pickerill, Bunting and other investigators, it is probable that lime salts are deposited in the outer surface of the enamel. The saliva forms a dialyzing membrane over the surface of the teeth, and, when sufficiently charged with calcium salts, it is supposedly depositing these salts in the outer surface of the enamel. When a tooth surface is kept free from bacterial plaques, one of the functions of the saliva is to preserve, if not to increase its calcium content, but when the surface is covered with bacterial plaques, not only is the saliva kept away from it, but acid fermentation is taking place on that surface all the time, and the acid so formed is constantly drawing upon the calcium salts in the enamel to neutralize itself.

Prophylaxis is saving teeth today and is improving general systemic conditions, and I hope that every practitioner here tonight will be stimulated to put as many of his patients as possible under the oral prophylaxis regime, for every dental practitioner should be a specialist in oral prophylaxis and in pyorrhea as well. If he is watching for and treating pathological conditions of the oral cavity, he cannot help but study the conditions which cause its diseases, and if he learns to recognize and remove the cause of dental troubles, he is practicing prophylaxis. I do not believe that we need more pyorrhea specialists, but we need more general practitioners who recognize conditions, which, if not corrected, will produce pathological results. I believe that the pyorrhea specialist, who does nothing but pyorrhea work and sends the patient back to the dentist, who in the first place was unable to prevent the development of the disease, will not be a permanent fixture nor a success in the dental profession, because a man who is not treating these conditions does not realize the causes which produce them. A great deal of dentistry allowed to pass in our dental schools is responsible for many of the pyorrhetic conditions we meet. I hope we shall all live to see our great institutions of dental education able to stimulate in the student body as much, or more interest in oral prophylaxis measures than the major portion of it now takes in prosthetic work.

THE MENAGERIE OF THE MOUTH.*

BY DR. B. J. CIGRAND, BATAVIA, ILL.

As the old French term "menagery," meaning a place where wild things are enclosed, fitted the conception of the wild, devouring lives enclosed in the oral cavity, I believed that by this title we might make a visit to a Gulliver, or enlarged mouth, and there view the great army of animalculae held captive in the oral cavity. Treating this human Ora as a circus, we might be more deeply interested in such an excursion, and visit the cages, or in this instance the cavities; and in our first visitation just hurriedly walk with the crowd and note the varieties of microscopic lives which are on exhibition daily and nightly—without intermission. The show is continuous; the performers are cheered on in their work by a sonorous—band—string music—called the human voice, and now and then the trainer, with a big toothpick, comes in and stirs the animals. The canopy of their mouth, with its "palatal" red and its embossed frescoes of rugae, encircled by hanging enamel cages, presents a most beautiful dome. The floor of the circus, the tongue, which is covered with the softest carpet, with its yielding papillae, is especially agreeable to the visitor's feet. But the floor or tongue has an additional new circus feature, as it will admit of elevating the audience to the upper row or gallery of cages, and hence it disposes of the narrow elevators which accommodate too few at a time. In front of the circus two mammoth red sheets—the lips—form a most conspicuous contrivance for entrance and enclosure, separating at center and raising and falling to admit us.

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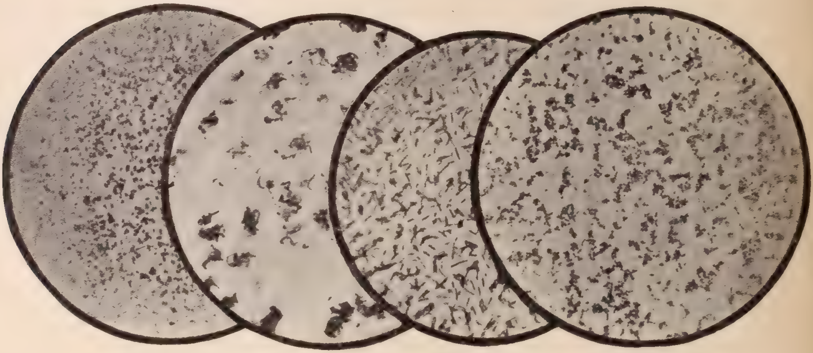
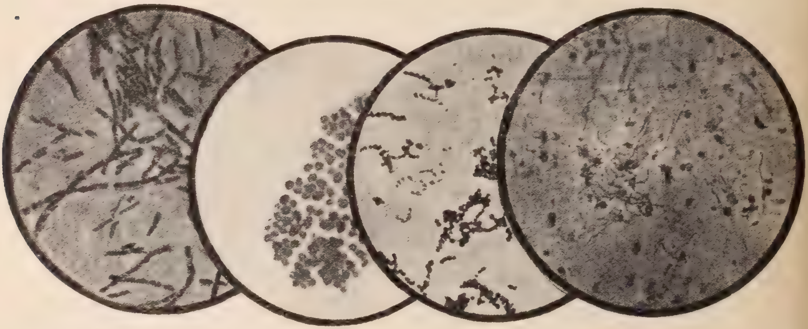
*Read at semi-annual meeting of the Fox River Dental Society at Geneva, Ill., January 12, 1916.



Micrococcus catarrhalis Pneumococcus Bacillus pyocyaneus Staphylococcus aureus

Further details will be given as we progress in this journey of the circus "Homo Oris." The advantage in casting aside the microscope and lending that ever-fascinating method, "the imagingative, that fairlyland method," that earliest and, after all, most potent way of story-telling, will again awaken in the older of our visitors to the show a newer, and possibly a keener, interest in



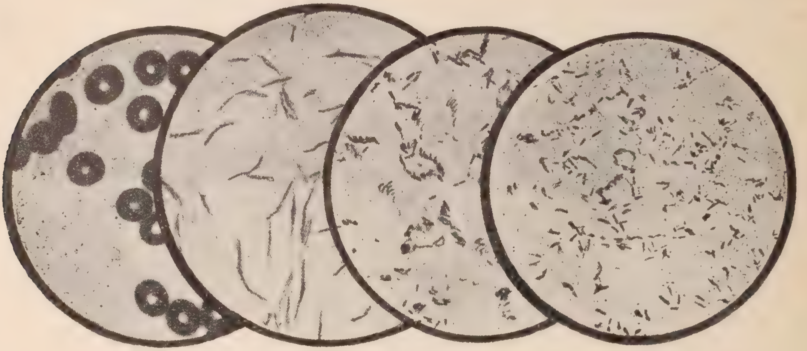
Bacillus maximus buccalis Streptococcus pyogenes
Saccharomyces neoformans Spirillum sputigenum

what we have to tell you. And it is my mission to tell you and lead you and instruct you as best I know, so we may enjoy the trip.

These animals we shall view are alive, eat, sleep and rest. They have habits of most interesting natures; they have foods of special delight; some love the dry land and others the deep blue sea. Some go in small colonies, while others prefer thickly-settled communities. These animals, or animalculae, as they are called in the vulgar study of microscopy, have a most interesting existence, and without some of their labor and some of their likes and dislikes human life, indeed, would be short. These bacilli, these microbes, these germs and these infinitesimals are far more devoted to the destiny for which they are created than the average human visitor suspects. When we are informed that these millions of small lives eat candy, peanuts, crackerjack and caramels, we say: "Indeed, you can call it going to the circus; for without these accessories no circus could exist."

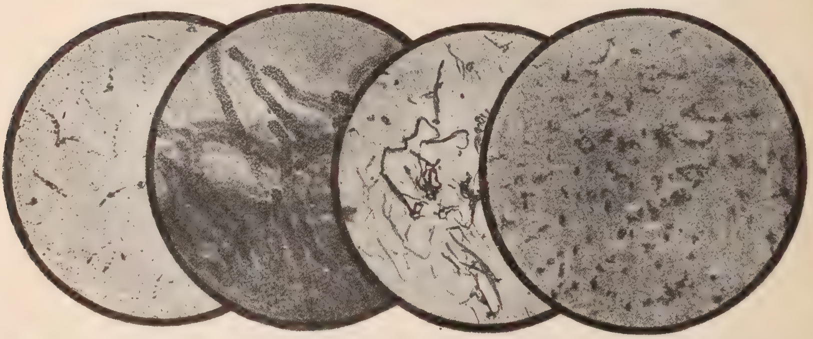
When the scholar and investigator, Leuwenhook, of Holland, announced late in 1578 that the air and all material things were filled with minute living organisms he astonished the world. But when he, while in company with some intimate friends, chanced to meet a tramplike vagrant, and upon passing the ill-kempt and neglected human specimen, remarked that "there are more minute living things in that beggar's mouth than there are people in all Holland," his companions questioned his sanity. Time has demonstrated that the famous Dutchman was correct, and generations since his time have learned the purpose and destiny of these micro-organisms. He had the courage to announce his findings, which demanded in those days a fortitude akin to a willingness to die at the stake or be placed behind huge locks and cold bars of iron. There has arisen from his discoveries more debate and more investigation than from any physiological disclosure since the dawn of time. He introduced us to a new phase of life, and acquainted us with the value of an animate creation whose numbers—like the sands of the sea or the leaves of the forest—are beyond the capacity of our mathematical skill to record.

Cleanly as may be the mouths of the distinguished circus visitors, the infinitesimal life present in the oral cavity of us here assembled measure more millions than there are people in all our country. Some of the minute organisms are not only harmless, but necessary in our continuance of life. They aid in a thousand ways to stimulate the secretions and assist in the processes of both waste and repair; but there are other micro-organisms within our mouths whose presence are indeed threatening, and whose lodgment is a damage to both our mental and physical well-being.



Bacillus influenza Bacillus fusiformis B. mesentericus Bacillus diphtheriœ

The world today is intensely interested in these low forms of life—in these distantly-related companions, for such they really are. We have so carefully studied into their existence that we have classified these thousand different varieties, and now and today know them as by distinct a name as is the optically-



Bacillus necrodentalis Leptothrix racemosa Streptothrix buccalis Spirillum sputigenum recognized horse, dog, tiger, bear and wildcat. The investigators know their habits as thoroughly as we know that of the fox, deer or squirrel. We as completely comprehend where they can be found and upon what they thrive as does the fisher where the perch, the bass or the pickerel can be found. All this is true scientific record; there is little guess about it. The facts are recognized not alone in American laboratories, but as thoroughly understood in foreign rooms of investigation.

The naturalists who have gone into the study of these animals, and who have reported their habits, are Miller, Black, Goadby, Kolle and Gallipe.

These animalculae are:

Agglomeratus
Aridus
Bronchitidis putridae
Buccalis
Bullosus
Chromicolor
Coccineus
Coccoideus
Coli communis
Digitatus
Diphtheriae
Epidermidis
Foliaformus
Friedlander
Fusiformis
Gangrenae pulpae
Gingivitidis
Graveolens
Influenzae
Kreibohni
Lactis aerogenes
Lepra
Luteus
Maximus buccalis
Necrodentalis
Necrosis
Pestis bubonicae
Plexiformis
Pneumo septicus
Pseudo diphtheriae
Pyocyaneus
Pyogenes gingivae
Ramificans
Rhinoscleromatis
Rosenthalin
Salivae minutessimus
Salivarius septicus
Sputicola
Sputigenus
Squamous
Subareus
Suratus
Tenuis sputigenus
Tuberculosis
Virescens
Viscosus ochracens
Zonatus

Then there is the Leptotrix racemosa (Vincentini).

Also the following micrococcus:

Catarrhalis
Lactericens

Citreus granulatus
Commensalis
Diplococcus intracellaris
Diplococcus pneumoniae
Gingivae pyogenes
Hauserii
Ochraedus
Reesi
Sublitis
Subroseus
Tetragenus
Viscosus

And these two specimens:

Saccharomyces albicans
Saccharomyces neoformans

Besides the following:

Sarcina alba
Sarcina aurantiaca
Sarcina aurea
Sarcina lutea

Add to these the following:

Sarcina variegata
Spirillum sputigenum
Spirochaeta denticola
Spirochaeta pallida
Spirochaeta refringens
Streptococcus angiosus
Streptococcus brevis
Streptococcus conglomeratus
Streptococcus faecalis
Streptococcus longus
Streptothrix actinomyces
Streptothrix buccalis
Streptothrix ochera
Vibro Finkler Prior
Vibro Milleri
Vibro tonsillaris

I can imagine some of the visitors saying, "Fiddlesticks! All bunk!" and a few other exclamations regarding these little lives. Yes, they are useful at times; but they must come at the right places, and at the right time, in the right person. If you can determine these three factors, why, stop practicing dentistry, as the world is looking for you, and will bequeath to you more precious metal, greenbacks or yellowbacks than you can ever earn putting in gold inlays or polishing repair cases. Now when these microbes and bacteria begin to perform, the "stunts" are called Tuberculosis, Typhoid, Scarlatina, Rheumatism, Influenza, Diphtheria, Pneumonia and a half hundred other names.

The shapes of these microscopic lives are varied; some are long, thread-like, others short and plump, and a few others hyphenated like a wasp; and another specie has sectional joints. In all they are multiformed and curious featured. They migrate like a band of roving buffaloes, though a few settle down and do pioneer work. Most of them enjoy living near the springs, hence some locate near the fountain of Steno, and the gushing springs of Wharton, or Rivinius. Then there are small rivulets which come down the buccal hill sides and along these acid waters are innumerable villas of bacteria. These small streams unite with the waters of the alkaloid geysers of Lakes Parotid and Sub Lingual and the entire flow forms the chief stream, called Rio Saliva, where most of these animals take their daily bath. Normally this river is alkaline. The interior of the circus is kept at a comfortable temperature by the cardiac heating plant, much like our modern hot water system; the huge as well as minute pipes are filled with a cardinal fluid and all these heating tubes are hidden within the walls of flesh, though some are enclosed in the osseous timbers.

The circus is supplied with air currents which alternate in direction, the incoming cool breeze is called wind of inhalation, while the outgoing warm zepher is termed the exhalation. Sometimes a tornado suddenly arises—called a sneeze or cough—which is dangerous to the visitors as it violently pitches many of the animals from their cages or retreats. Three times a day there occurs a freshet at the circus. The flood may consist of brown fluid known as coffee, tea, chocolate or other flushing stream; these floods may be hot as fire, or cold as ice, but these animals resist them and fortify themselves against these inundations. The periods of these heavy floods are called breakfast, dinner and supper. Not infrequently a snow storm accompanies the flood, and ice cream is banked high and tight against the cages, but the animals enjoy it all, even to the frosting on angel food, so called, I suppose, because those who partake freely will soon become angels. These animals do not live in a state of harmony, though there are some which are peace advocates, at any price, but many are supporters of militarism and a constant incessant battle is on, and the trenches are filled with the dead and maimed. Their powder, dynamite and explosives are manufactured from huge morsels called mouthfuls and here they extract nitrogen, glycerine and other bases for breaking up things and destroying and disorganizing matter.

Some of these animalculae prefer to act up in the summer, and seem to enjoy the intense heat, while others do their best in the cold and frigid season, thriving when ice forms and mercury hides within its bulb. If we were to attempt to kill some of these low forms of life, we would not take a shotgun, rifle or air pistol, but throw strong acids on their bodies or bathe them with burning alkalies or shock them with electric waves. They are sure resistful, some having the proverbial nine lives of a cat. Some will fight off carbolic acid and others have a glorious swimming match in weak disinfecting fluids. The easiest way to rid the mouth and the surest way to stop their performances, is to have the caves filled with gold fillings, porcelain inlays or cap the entire cage with a gold crown. Scrub the entire circus with a huge bristling arrangement called a tooth brush and drive them from the tents with flushings of warm water and medicinal fluids. If the cages made of enamel and dentin are not of a strong kind, their bodily debris eats through like rust devours iron or steel and then once they are out of the cage they burrow into the ground or gums much like a ferret and keep up this subterranean tunneling until they get into larger cavities called glands of the neck and lobes of the lungs and pockets of the stomach and recesses of the liver and other points for food and shelter. Some of these microbes, bacilli, germs, animalculae and low forms of life are gentle and kind as a rabbit, while others are as vicious and ferocious as any snake of the jungle; the former kind we love, in fact we require, but the latter performers are too dangerous and we do not wish them, as they are harmful, destructive, unfriendly and malicious.

The dentists have taught the world more about the care of the mouth than all the other professions combined, and it is to the glory of our vocation that we have discovered many of these microscopic lives.

SOME OBSERVATIONS ON BRIDGEWORK.*

BY DR. H. F. D'OENCH, SAINT LOUIS.

Upon delving into the literature of bridge construction, we were forcibly impressed first, with the fact that the art is largely empiric and very far from the status of being a fixed science; secondly, the calamitous thought obtrudes, that the most painstakingly prepared bridges are often of but temporary service.

So eminent an authority as Dr. Fred Peeso (*Items,* May, 1910) says concerning modern bridgework, "Considering the opportunities which the present generation has had, taken together with the experience of those who have gone before, and also considering the number of those who are doing the work now, as compared with the number who did it in the past, it is a question as to whether we have any cause to flatter ourselves about the progress we have made." Also from the *Items,* October, 1910, Dr. Herman Chayes, "The most diligent perusal of much that has been written on this subject fails to disclose anything really scientific and accurate—anything which would seem to be based upon sound knowledge of the requirements to be filled and the dynamics involved. At best one is brought face to face with results that are unsatisfactory, incomplete, unsuccessful, unwholesome and unclean." *Cosmos,* December, 1912, Dr. Wm. Hulick, "I believe more teeth are lost by faulty construction, misapplication of force, lack of knowledge, or a total disregard of the pathological and mechanical principles and requirements than by any other cause." The foregoing sentiments, doubtless conclusions drawn from personal experiences, are expressed not only by these, but by many other able authorities; with the average dentist's results we are all too familiar.

While many changes in styles of bridges have been evolved since the articles quoted above were penned, the "underlying principles" remain unchanged. These principles, while representing the best judgment of our brilliant prosthetists, rest upon the accumulated data of the profession and upon custom and usage, but have not, to the present time, been fixed by axiomatic laws of science.

A solution of many of our problems of mechanics may be found by a more detailed study of the forces of mastication. The dynamics involved have, thus far, not received the attention which their importance deserves. Black, in his chapter on "Strength of the Bite" (Operative Dentistry, edition of 1899), scratched the surface only when he found the stress to which normal teeth were subjected in biting. That he attached importance to this matter is evident from the following: "A careful study of persons in regard to the force they use in biting seems to me almost essential in the practice of dentistry. I wish everyone could be equippd with instruments for taking the bite of persons."

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*Read before the St. Louis Dental Society, December 7, 1915.

Your essayist is convinced that upon the development of the science of dynamics, more uniformly successful bridge construction would result; a more rational selection of qualities, quantities, bulk and kinds of metals to withstand stresses; a more uniform preparation of teeth to be used for abutments; and a better understanding of ratio of porcelain bulk to the supporting frame work, a ratio of dowel length and gauge to length and diameter of root might be determined. As these and many other details are worked out at present, they represent a chaotic jumble of ideas that are the product of—judgments and whims—tied to the hackneyed phrase "personal equation."

How much stress as measured in pounds—shearing stress, bending stress, transverse stress, etc., will Richmond, Logan, Davis crowns, or other combinations of porcelain with gold, withstand? How much stronger is a banded crown than a crown without a band—and why? We arbitrarily use 24-karat, or 2½ to 15 per cent platinum alloys, down to 18-karat gold for inlay and shell crown abutments. We use 20, 18, 16 or 14-gauge iridio-platinum wire dowels; long and thin or short and thick, round, eliptical, square, triangular, threaded, barbed or smooth dowels, "when necessary and expedient." The resistance to tensile stress, or compression stress, in bridges as measured in pounds is what? Guesswork. How much reliance may we place on the resistance of cement to the various stresses mentioned above? Should our bridges as they are now assembled prove of permanent value—we applaud—and are lucky; if not, we ascribe the cause to "poor judgment."

The foregoing are but a few of the many questions which might be answered in terms of science and with a correspondingly improved ratio of successes to failures, could we but find the lover of research, who would devote the time and ingenuity necessary to solve the problems presented.

In view of the fact that we have no statistics on stresses for guidance and no equipment for their computation, we will now turn in the usual empirical manner to some observations on anchorages where attachments to sound natural crowns become necessary.

As these cases are fairly numerous, we will confine ourselves, for the sake of brevity, to the discussion of the six anterior teeth to be employed as abutments for fixed bridges, and will suppose them to be firm in their alveolar attachment and in normal alignment and occlusion.

For convenience we classify methods of mutilation as follows:

First—Total excision of the crown and use of artificial substitute.

Second—Open-faced crowns.

Third—Partial crowns which include subdivisions.

a Plate and Pins—vital teeth,
b Inlays with or without pins—in vital teeth,
c Inlays with post—and devitalization.

The first method need now be rarely employed, and the second is deservedly practically obsolete, both having been superseded by some form of partial crown.

Subdivision A of third method as described by Goslee (in Principles and Practice) and recommended by Evans (Crown and Bridge), Hinman and others, while ingenious and tempting, are usually delusive and unreliable.

The only indications for this class of attachments are in the lower incisors, where one or at most two incisors are to be replaced, and in other locations only when there is no occlusion with opposing teeth. Thos. P. Hinman (*Cosmos,* March, 1915) is quoted simply as an example of a recent and good description of this class of attachment and not for the purpose of disparaging this particular writer's effort.

"We will use for illustration a canine as an abutment, aiming to replace a lateral incisor. The preparation of the tooth is accomplished by cutting a step in the lingual surface of the canine about one-sixteenth of an inch above the gum line; another step is cut in the same surface along the line of approximal contact mesio-distally. These should be well defined and extend to the dentin sufficiently to give resistance to the finished hood. The mesio-lingual surface is then removed with the same stone, carrying the cut gingivally in line with the lingual step. This removal is necessary to prevent re-decay and give a firm attachment for the soldering. If the occlusion is very close a portion of the lingual enamel is removed. With a No. 3 bur, a hole is drilled in the lingual step about one-sixteenth of an inch deep, in line with the long axis of the tooth. Two holes are then drilled in the occlusal step in the same manner and to the same depth. The last holes should straddle the pulp. Sometimes it will be found necessary, instead of putting two holes in the occlusal step, to put one in the disto-occlusal and the other in the mesio-gingival step. The placing of these holes must be done according to the case in hand."

Dr. Hinman uses 20-gauge irido-platinum wire for pins, a pure gold backing; over which inlay wax is flowed—casting made with a gold alloy.

You will observe that abutment pieces of this kind are mechanically incorrect in as much as too much dependence is placed upon the cement; the pins of necessity are of small gauge and are the sole provision against lateral and torsion stresses.

B—That of using inlays with or without pins in vital teeth have proven equally unreliable, especially when applied to bridges with more than one dummy, owing chiefly to cavity preparations lacking sufficient resistance form, to injudicious choice of bulk and rigidity of metals employed, and in many cases complications due to pulps dying.

C—In our practice, adequate anchorage for inlay attachments, where more than dummy is indicated, has been secured only by the use of a post in the pulp canal, therefore we do not hesitate to advocate devitalization in all cases where inlays are thus employed in support of bridges, which are expected to be of relatively permanent service.

Devitalization brings up the spectre of "Local Foci of infection as related to Systemic diseases."

Rhein and more recently Ottolengui at our state meeting have described a technique of root filling, which if conscientiously followed, assures us a definitely aseptic operation, thereby eliminating this menacing factor.

The fear of discoloration of devitalized teeth should be banished as such a calamity is entirely avoidable and its occurrence inexcusable. An outline of technique for prevention of discoloration is here submitted.

A hole is cut with a ½-mm drill in the lingual surface at the incisal third and in the axial plane, care being taken to just avoid exposure of the pulp. The cavity is then enlarged with a No. 4 bur; a small quantity of devitalizing paste, to prevent undue congestion, is sealed in with cement. Insist upon return of patient in 48 hours if an adult; if a young patient, in 24 hours. Thoroughly remove paste, apply dam, enlarge cavity and expose pulp; if still sensitive apply pressure anesthesia and extract pulp. Canal is thoroughly reamed to remove all odontoblastic cells adhering to canal walls. Wash with distilled sterile water applied on cotton with sterile-broach, until all bleeding has ceased. All hemmorhage must be checked and every trace of blood removed because discoloration is caused by breaking up of red corpuscles, and subsequent penetration of hemoglobin into the dentinal tubules. Avoid oils as medicaments, as they fix any color remaining in the canals. A wisp of cotton dampened with campho-phenique or thymo-camphine may be used as a dressing, carefully sealed with cement and patient dismissed for 24 hours. If there has been no bleeding, the root may be immediately filled and no drugs need be applied.

While treating teeth to be employed as abutments, models and bite are usually articulated, for the purpose of studying occlusion, direction of stresses and determination of parallelism.

The root filled, we proceed to cut a cavity. The mesial or distal surface as the case requires, is cut labio-lingually to parallel or slightly incline to the mesial of the axial plane of the tooth. The lingual marginal ridge is cut away to insure strength of enamel and for ample surface and bulk of metal for strength of joint with dummy. A gingival seat and a labial wall are formed, both at right angles to the axial wall. Maximum resistance to lateral stress being imperative, it is necessary to cut a step, the position of which is determined by the degree of inclination of the tooth from the perpendicular, and by the requirements of paralleling. Where possible the step should be confined to the lingual surface for esthetic reasons; but when teeeth are in perpendicular position, we necessarily extend across the incisal edge. The cut is made in the horizontal plane and with a flat base to include at least two-thirds of the mesio-distal dimension of the tooth. Further security against lateral displacement may be attained, when deemed necessary, by cutting a groove with flat base at termination of the step at right angle thereto—i. e.—labio-lingually; or the inlay may be locked in by abruptly deepening the terminal end of the step.

The canal is now enlarged and a post fitted, care being taken to have all parts of the cavity and post in alignment for withdrawal of the wax inlay with attached post. The gingival and the lingual enamel margins are beveled as for foil fillings. A wax filling is carved with posts in place, removed, and immediately invested for casting.

In the writer's experience with various and numerous methods of operating upon incisor teeth for abutment pieces, the above cavity preparation, which conforms to Black's teaching, has proved the most dependable; such failures as we have had being mainly due to our ignorance of the amount of stress to which our work was to be subjected, and consequent shallow cavities and injudicious choice of quantity and quality of metals employed. We have found that cavities in all dimensions should be of sufficient depth to receive an inlay of no less than 1¼ mm thickness, with an additional bulk of ¾ mm where dummy is to be attached.

Gold of 22 and 20 karat plate have been employed and latterly the formula of Dr. Tinker, consisting of two parts 22K plate and one part clasp metal has seemed best for the purpose. The post of iridio-platinum wire of 16-gauge enters the pulp canal to a depth approximately equalling the length of the crown of the tooth.

In this connection we wish here to reiterate, and to emphasize the idea presented in the first half of this paper, namely, that not until laboratory experiments shall have determined the stresses as measured in pounds to which our abutment pieces and bridges may be subjected, shall we be enabled to rationally select materials to withstand such stresses or to cut cavities for their reception with the definite assurance that they will meet requirements.

It is manifestly impossible to do even approximate justice to the subject chosen, which would entail the labor of years rather than the preparation limited to odd hours of a few weeks. Knowing, however, how much you enjoy technical problems, the above observations are presented solely for the purpose of stimulating a general discussion and not for that of riding a favorite hobby.

FACTS, FADS AND FOLLIES CONCERNING PYORRHEA.*

BY C. E. BENTLEY, D. D. S., CHICAGO, ILL.

That we should pause and get our bearings on this wild sea of confusion regarding pyorrhea is, to my mind, absolutely imperative. The daily press and monthly magazines of the lay world, the spoken and written word of the medical and dental professions have so stirred the public consciousness during the last two years, that it is not an exaggeration to say, it is fairly seething today. In its wake have followed innumerable so-called "cures" at which the public have grasped as a drowning man would a straw, with similar results. After two years of this wild intoxication a sober analysis reveals that many of these experiments were immature, much of faulty observation, hasty conclusions, and unwarranted premises.

The cause for this sudden assault of the imagination and consequent strabismus of vision was the announcement from authoritative bacteriologists and pathologists that a number of diseases which theretofore had been obscure as to their origin had beyond a doubt been proved to come from the secretions found in the mouth about pyorrheaed teeth. Among the diseases so classified were acute and chronic arthritis (Rheumatism), Myostitis, Endocarditis, Neuritis, gastric ulcer, appendicitis and others.

This fact has become so fixed in the minds of the medical profession today that a physical examination made to find the cause of any of the diseases referred to that does not include the mouth is not considered complete. Indeed so suspicious has the medical profession become of this dreaded disease that in many instances teeth that might be saved and render service for years, if properly cared for, have been ruthlessly extracted, and the patient reduced to the necessity of substituting artificial ones for masticating purposes. It is because so much of fad and folly, and so little of proof and fact, have entered the question, that this paper is written.

The many futile attempts of the medical and dental professions, together with their accompanying discouragements, have from time to time been startled into new life by the pronouncement of a new discovery, backed by credible testimony, as a cure for this malady.

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*Read before the Northern Illinois Dental Society, October 20, 1915.

Before I proceed further, at this point let me define what I mean by a "cure."

By *cure* I mean the total disappearance of pus, the filling in and obliteration of pockets, the return of the gums to a normal pink color, becoming hard and firm, and a tightening of the loose teeth effected.

The first ray of hope that came to us was Dr. Joseph Head's *tartar solvent.* After a period of experimentation by the profession this ray flickered and went out. Hard upon its heels came the *vaccine treatment,* which consisted of shooting several billions of dead bacteria of doubtful ancestry into the patient's organism in the hope that some few of respectful parentage would overcome and evict those of bad reputations. It is an accepted fact among vaccine thereputists that autogenous vaccines are of no avail unless a serum is made of pure culture from a specific organism suspected of producing certain pathologic symptoms. It is also understood that the virulence of an organism may be modified in a comparatively short time, and that the serum extracted from the organism for vaccine purposes will have no specific effect upon the progeny of said organism after this morpnological change has occurred. Can we wonder then in this maze of uncertainty that such uncertain results have been secured? The consensus of the profession today is that this treatment fails to cure.

Then the world was fairly swept from its feet by the *emetin chlorid treatment.* The lay press was particularly enthusiastic. For instance, I remember reading in the Sunday Magazine of one of our great dailies of Chicago how an old, doddering roué ambled into a dental office seeking this treatment. It recited that he could shake his teeth farther than he could shake his head. He took one treatment of Emetin. Presto! His teeth were firm and could bite off the heads of ten penny nails. Because this treatment was pronounced by capable men, and had been tested in the laboratory and clinically, the profession took this treatment like a cat does to a bed of catnip. But, alas, what is the verdict today? There still remain some champions who herald it, and there are those who subscribe to the statement of the dentist who said, "Emetin will cure pyorrhea provided you immerse him in a vat of it and wait for the bubbles to cease."

Alcresta ipecac came next with a blight of the sanguine hopes so beautifully heightened by the drug houses, and now no later than April 10th of this year come Drs. Wright and White of the Navy, who claim 100 per cent cure in 28 cases of this disease, by injections of *mercuric succinimid*. The treatment proceeds upon the theory that mercury has an affinity for vegetable parasites. The endamebae are not vegetable parasites. If not, and they are the cause of pyorrhea, as hinted at by Barrett and Smith, and claimed as such by Bass and Johns, what becomes of their theory and cure? As Smirnow says in September *Cosmos:* "If the endameba is the primary cause theoretically the mercurial treatment should be useless, and vice versa, if this method of treatment is all the writers claim for it the probabilities are that the endameba is but a secondary invader." However, this form of treatment has not been verified and time will soon test its merits. To those of you who are daring and can persuade your patients to become a party to the act, I say "go to it." For myself, I have been so often kicked I am getting a bit "gun shy." Not that I am losing courage or my faith that we will ultimately master this disease, but I wish to maintain my self-respect.

I have been treating pyorrhea with average success for more than twenty-five years, being keenly alive always to any new thought or method for its alleviation or cure. I have, however, been strictly honest with my patients in telling them I could not cure their pyorrhea, but the best I had to offer was a relief from the acute symptoms, putting the teeth in a comfortable condition, educating them to aid in the prophylaxis of the mouth, and have them return for similar treatment at stated intervals. Obviously if I had them return for treatment at intervals they were not cured. In the great majority of cases thus treated it has paid. I have in mind a gentleman who has followed this regime for twenty-four years under my care, and he is now seventy years of age, and has never lost a tooth. You will pardon the personal note, but it has a bearing on what is to follow. I spoke of self-respect.

I wish to quote verbatim two letters that were the subject of an editorial in *Items of Interest* of September last:

THE TREATMENT OF PYORRHEA FROM THE VIEWPOINT OF THE PATIENT.

A general practitioner of dentistry, residing in Brooklyn, during the past twelve months has received two letters from patients dealing with their individual experience in the hands of pyorrhea specialists, which are so illuminating that they are herewith presented for the moral effect which they may have. The first letter dated August 2, 1914, reads as follows:

"My dear doctor:

"You will be interested to know that at last pyorrhea is claimed to be permanently cured. I have just taken the treatment given by Dr. V., of Paris, who guarantees that my gums are now absolutely healthy and free from all pus, and pockets will remain so.

"First, a culture was made from the pus by the doctor from the Pasteur Institute, and twice weekly for four weeks I received an injection of 'bugs' in progressive quantities, the last three being each two billions.

"Then twice a day for twenty-one days my roots were scraped and cleaned and the gums treated with various drugs until they finally were of that pale pink, healthy hue that I never expected to have. It would pay you to have your assistant come over and get in touch with Dr. V. I met dentists from Milwaukee, Chicago and Philadelphia who knew and spoke highly of you, who were investigating at V.'s office this cure, and who marvelled at the success he had with my gums. They were enroute to the International Dental Conference at London, which is to be held this week, and at which V. presents a paper on pyorrhea. I am inflicting this letter upon you because I am interested in you, and because I feel sure you will be interested in it. Hoping you are having a pleasant summer, and with my best regards to you and yours, believe me,

"Most sincerely yours."

Says the Editor of the *Items:* The interesting feature of this treatment is its comprehensiveness. The patient not only received injections twice weekly for four weeks, but after that the roots were cleansed and scraped and various drugs applied to the gums twice daily for twenty-one days, till his gums had a healthy hue that the patient had never expected them to have. The natural query arises, was it the vaccine injections which effected the cure, or the forty-two sittings of cleaning and scraping, or the drug application? Or was the result dependent upon all these together? The writer confesses that he is confused, and finds it difficult to determine the due proportion of merit attributable to each part of the treatment. It is noteworthy, however, that this case appears to have been cured without emetin.

(N. B. Since sending the above to the printer, the writer has learned that this patient has presented recently with pus oozing around several teeth.)

The second patient, "treated in America," received quite as many kinds of treatment, but with less benefit, judging by his letter, which is as follows:

"My dear doctor:

"I have had so much work done on my teeth with apparently anything but beneficial results that I am writing you to give you a little history of my case, as it may possibly be some aid in treating me.

"Practically all of my teeth have ached for the past two or three years. There were no cavities. However, Dr. H. of Philadelphia (dentist), thought that it was a gouty condition, and could probably be cured by removing the nerves and cleaning out any foreign deposits at the roots of the worst teeth; at the same time treating them with an electric battery. He also took some pus from the roots and made a serum and gave me a hypodermic injection every week for three or four months. At the same time he had me drink about two quarts of water per day. These efforts may have helped, but they did not cure.

"Dr. H. was guided somewhat by Dr. S. (physician), of Philadelphia, who had had me in the hospital for intestinal trouble. Both the dentist and the physician thought that my trouble with my teeth was due partly to my intestinal trouble.

"I later went to Dr. B. (dentist), New York. He treated my teeth for three or four months with no results. He sent me to Dr. H. (claimed to be a pyorrhea specialist), New York, who, so far as I know, did me no good. Dr. B. then sent me to Dr. R. (physician), New York, who claims that my trouble with my teeth is all due to my intestines. I have been following his prescriptions and diet for nearly a year, perhaps with some good results.

"I am certain that the dentists wasted a great deal of good time filing and sawing at my teeth. They have filed them down to such an extent that they are practically smooth and greatly reduced in usefulness. "Very truly yours."

These exhibits are fairly indicative of what we may expect from these new "cures," which have been so widely exploited, by lay and professional press, and so misleading to the general public. The self-respect of the profession should call a halt and certain demands made before we entirely lose the confidence of the public.

I maintain we have no right to give our approval or countenance to any of these so-called "cures" until certain inexorable laws of science have been complied with.

To begin with, no one knows or has the right to say what the cause of pyorrhea is. In 1914 Barrett in collaboration with A. J. Smith, demonstrated the presence of the endameba bucalis and introduced the emetin hydrochlorid method of treatment. Bass and Johns subsequently claimed that the endamebae are the specific cause of pyorrhea, also that bacterial infection of pyorrheal pockets is not primary but secondary. They also claim that pyorrhea is cured by emetin hydrochlorid by daily treatments of from three to six successive days. How then are we to dispose of the statement of Hartzell, who in the examination of 2,000 cases states he has invariably found the streptococcus veridans in every case? Rosenow, Billings and others have isolated other bacteria —namely, streptococci-pneumococci and diphtheroid bacilli in some forms of arthritis where the cause suspected was pyorrheal, which would strengthen the claims of those who suspect the cause to be bacterial.

Thus we have varying opinions between men capable of speaking authoritatively as to the etiology of this disease. The one side claiming it to be the endamebic, the other bacterial. The former advising the injections of emetin, the latter largely resorting to autogenous vaccines. In the meantime the medical and dental professions, together with the public, clamor for the technic and remedy of these wonderful "cures." The drug-houses scenting the possibilities of a harvest of sheckels from the gullible, readily lend their aid and influence in the despoilation, and in a few months chaos reigns.

If it be infectious there are certain laws laid down by Koch that must be adhered to before one can claim the right to say it is a cause. Those laws are:

1. The specific organism must be associated with the disease.

2. It must be isolated apart from the disease.

3. When introduced into healthy animals it must produce the disease, and in an animal in which the disease has been experimentally produced the organism must be found under original conditions.

Until this law is complied with we have not proven what the cause of the disease is, and until we do specific cures are the merest guess work, a bauble for the credulous to play with. Let us not fool ourselves or our patients any longer, until we have a scientific foundation upon which to place our feet. 'Twere better to hobble upon the crutches we have than ride in unsafe automobiles.

Now, in this seeming riot of destruction I don't want to be considered an iconoclast; a destructionist without something to offer in the place of that I would destroy. I want to be placed upon record as having respect for the testimony that has come from reputable men in the profession who testify they have secured results from the treatments referred to. At the same time due consideration should be given to the vast number of men who have tried these remedies with as much enthusiasm and conscientious regard as to technipue without obtaining similar results.

The rationale of the vaccine and emetin treatment seems, in some cases, a supplemental one to that of thorough surgical procedure.

I shall now try to strike a balance by being constructive. It seems to me the sanest utterance yet made upon this subject is that of the late Dr. G. V. Black in his last book, "Special Dental Pathology." The disease is considered from every aspect. The recital of his long period of experimentation together with his mass of evidence makes the logic of his conclusions inescapable.

Briefly stated, practically the beginning of all so-called pyorrhea is in gingivitis, which is chiefly induced by trauma, the chief causes of which are calculi, lack of contact points between the teeth—crowns—overhanging margins of fillings at the gingivae—and malposition of teeth in the arch. Says he: "Faulty contact points constitute the chief factor in the causation of this form of disease. Within my observation more or less have been caused by faulty contacts than any other forms of injury." "If for any reason there is a slight opening between two teeth, food which is tough and stringy will be crowded into the interproximal space and cause pressure upon the septal tissue. Or if contact is too broad, stringy foods, such as fibers of beef or chicken, are likely to be caught between the flat surfaces and held there, thus injuring the septal tissue. This frequent impaction of food against the septal tissue becomes habitual and the tissue becomes more and more injured. As a result inflammation ensues. In the earlier stages the festoons become slightly swollen—continued irritation of this sort results in a marked redness of the gingivae which may lapse into a sluggish condition of chronicity at times. After a time suppuration occurs in the secluded space between the teeth affecting specially the attachment of the peri-dental membrane to the cementum. There has been so little opportunity with the ordinary methods of cleaning to prevent the growth of micro-organisms in these places—with the continuous reinfection which they afford that a chronic suppuration is maintained. This may be of such slow progress as to require years to accomplish the destruction of the peri-dental membrane to the point of loosening the tooth."

The logic of this general statement is that this disease has its beginnings at the gingival margin; that infection is a secondary result; that the tissue once detached from the cementum is not reattached; that our efforts to prevent this condition must more than ever be directed to inflammation of the gingivae.

Dr. Black divides this treatment into preventive and palliative. Concerning the latter he has more confidence in careful instrumentation than any other method.

All antiseptics are avoided, emphasis being laid upon irrigations of normal salt solutions, coupled with the education of the patient to care for the teeth so far as cleansing is concerned, and the extraction of those hopelessly loose, or of those in which the supporting structures are irredeemably lost.

The rationale of this statement, which is borne out by experience by those who have adopted a similar policy, is pyorrhea is a preventable disease. It may also be cured provided it can be brought under control before it reaches the incurable stage through long neglect. The treatment should consist of thorough curetment of the roots of calcarious deposits, and necrotic tissue, correction of occlusion upon effected teeth—restoration of contact points in interproximal spaces—massage of the gums by patient—a high degree of oral proxylaxis on the part of the patient, and frequent returns to the dentist to inspect, and if needs be, polish the exposed surface of the roots and crowns.

In cases where systemic reasons are suspected as the cause of pyorrhea there should be the freest co-operation between the physician and dentist.

As Sterling Hewitt says in October *Cosmos,* 1915:

"When the dental profession realizes that pyorrhea is a preventable disease, that in its early stages it is easily and permanently cured; that only those cases are hopeless that are long neglected; that no drug or vaccine ever will of itself cure the disease, and that dependence must be placed upon local treatment, they will have taken the first step toward the elimination from the mouth of their patients of the chief of mouth infection."

Or as C. N. Johnson says in October *Cosmos:*

"Indeed it may safely be said that with all the furor in the way of systemic treatment either by vaccines or by the much heralded emetin, the chief reliance for control of pyorrhea must rest at present with proper local management of the case." He further states: "Any deception of the public which has the semblance of exploitation reacts in an unfortunate way, and increases distrust which is hard to live down.

"The best interests of the profession and the people are conserved only when there is perfect confidence established on both sides and experiences such as we are having with the emetin treatment are not conductive to this end."

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

FIFTY-SECOND ANNUAL MEETING, HELD AT HOTEL LA SALLE, JANUARY 28, 1916, WITH THE PRESIDENT, DR. F. B. MOOREHEAD, IN THE CHAIR.

Dr. Edward C. Kirk, editor of *The Dental Cosmos,* Philadelphia, read a paper entitled "The Problem of Dental Education in the Light of Public Demand."

President Moorehead, in introducing Dr. Kirk, said:

I am not going to waste any time in the beginning of this program except to say that the Chicago Dental Society extends to every guest a most cordial welcome. You are here from all over the country and we are proud to have you as our guests. In this function, which we conduct once each year, we do not try to serve any vainglorious purpose or to do things for the sake of doing them, but simply to do what the individual ought to do conscientiously, honestly and efficiently. An organization in the mass should have the same conscience, the same purpose, the same aspiration, the same preparation as the individual should have.

We have with us tonight as our guest and essayist a man about whom I might spend a long time talking, but I am not going to do that. I am not going to waste any time in platitudes or fulsome praise. This man is known all over the world, and, I suppose, he is, speaking honestly and candidly, one of the most intellectual men in dentistry. He has had a wide experience and he comes tonight with a message borne out of that experience. He is to speak to us on "The Problem of Dental Education in the Light of Public Demand." It gives me very great pleasure to present to you Dr. Edward C. Kirk, of Philadelphia. (Applause.)

Dr. Kirk then read his paper.

President Moorehead, at the conclusion of the paper, said: Sir William Hunter, when he delivered his great Broadside, which has served a notable purpose, spoke at McGill University in Montreal. The distinguished gentleman who is to open the discussion on this splendid paper is from McGill University, and Dean of the Dental Department, and I am sure we all extend to our neighbor and our very esteemed friend from Canada our greetings. Dr. A. W. Thornton, Dean of the Dental Department of McGill University, will open the discussion on this paper. (Applause.)

Dr. A. W. Thornton, Montreal, Canada:

Mr. President and Members of the Chicago Dental Society: With the touch of an artist, Dr. Kirk has suggested some things leaving you the pleasure of supplying some, so that you will feel yourselves equally a part of the paper, with Dr. Kirk. He said that when the time comes to take the step for a closer relationship between dentistry and medicine, we will take it in good company because we shall be side by side with the other part of the healing profession. But the title of the paper suggests that there are problems to be solved before that time comes. I thought, as I read Dr. Kirk's paper, that it was almost like publishing the banns of marriage between two people who are about to be joined together in the holy bonds of matrimony, but the more I thought of it the more I was convinced that such was not the case. It is simply a coming together of brothers of the same family who for a long time have been estranged and who have been known by different names. In the City of Toronto for many years there were two men living who bore the same name; they were children of the same parents, but one was a Methodist minister, and the other was a dignitary in the Roman Catholic Church. It occurred in this way: When the boys were young their parents died. One boy was raised in a Methodist family and the other in a Roman Catholic family. They were in Toronto for years, together, good friends, each trying to accomplish the same work, and yet ministering to different flocks, and because of the peculiarities of religious—I was going to say—fanaticism; that is not the word, predilection perhaps is better—neither ever had a chance to speak to the congregation ministered to by the other. And so it is in connection with dentistry and medicine. Both are trying to do the same work, but for some reason they have not yet grown together and become known as brothers. You know how hard it is to eliminate from the mind any conception early conceived. So it is that in the world today we associate with the word "doctor" and "medicine" some peculiar ability on the part of some men who have taken a certain course to cure all ills to which the body is subject. There is in the popular mind an ill-defined idea that a doctor, because he has dissected the human body, has solved all the mysteries of the universe and they ascribe to him almost infinite power. Well, they may know all things, but personally I have always had doubt in my own mind whether they do or not.

But dentistry, at first, was mechanical, and people early associated the practice of dentistry with the extraction of teeth and the replacement of these teeth with artificial appliances. Later in life they added to this idea regarding the practice of dentistry the restoration of small parts of lost tooth tissue with some kind of filling material and bought the filling material at so much "per" and paid for it, and we were a kind of glorified mechanic. So the public was slow to recognize the advance that has taken place in the past twenty-five years in the profession of medicine. Now, the medical world has awakened to the fact, as Dr. Kirk has said, that many of the ills of the human body are attributable to mouth conditions, and we know ourselves that a great part of our work in the future is preventive, not curative, and that we must of necessity know more of the fundamental subjects which are characterized as strictly medical. How shall this be brought about? Dr. Kirk has suggested no remedy for the problem which has been raised, and I do not know that it has come seriously from the public, although the paper speaks of public demand. The public, the great mass of the common people, are usually the very last to realize their own supreme needs. The demand has come because the dental profession has realized the change which has come about in our operations, and that now a better and wider and more beneficent field opens for the future. How is this to be brought about? I do not believe the problem will ever be solved until there is a most radical change in the method of both dental and medical education. The very thing that occurred to the two brothers to which I referred, occurs in medicine and in dentistry. We are educated apart. We are known by different names. Neither one knows the possibilities of the other, and so there has been no common ground of understanding. If you will pardon a personal reference, I will refer to this educational problem as I have come in contact with it.

I went to Montreal three years ago thoroughly convinced that the conditions existing there were wrong. I was prejudiced against the conditions as I saw them, saying in my own mind, *but not loud enough to be heard by others,* that just as soon as possible I would bring about a change in the conditions there, and establish the conditions that obtained in most of the dental departments of the colleges and universities of this American Continent. This was, and is still, the condition there. The department of dentistry is a part of the medical faculty. Every subject which pertains to or is common to both dentistry and any other subject is taught in the department best equipped to teach the subject. Medical students are taught chemistry by the professor of chemistry. Metallurgy is taught in the metallurgical department of the University. Bacteriology is taught by Dr. Adami, the great bacteriogist and physiologist of McGill University. For the first two years medical students and dental students are all registered as medical students; they sit in the same class rooms, they listen to the same lectures, and have the same identical training. Then towards the end of the second year they take some special work in dentistry, and for the last two years their work is confined to practical dental operations. The result is that medical students know what the dental students are taking up in the first two years, and the dental students know what the medical men are doing. They have a common knowledge of each other and a better understanding of the training which each receives. Then following it out further, in the Dental Department of the University the dental clinic is an integral part of the Out-Patient Department of the Montreal General Hospital, and so the medical students and the dental students through their entire course are in the same buildings and doing the same work. When a man is sick from mouth conditions in Montreal and has to go to the hospital, he goes there and is treated by a man who has some knowledge of the healing art and he associates the healing of the diseased conditions with dentistry as well as with medicine, and I believe the time must come when some such plan as that will be worked out, and there will be a common education both for medical men and for dentists.

During the last two or three years men in the fourth and fifth year classes in medicine have come to me and asked if they might come to the dental clinic in the hospital and see the work that is being done there, but their only idea was that they might learn to extract teeth. Many of them expected to go out into the country to practice medicine and they wanted to know how to extract teeth.

I was wise enough to tell them that if they wanted to come to my clinic they had to go to the Dean and Registrar and make a request in proper form, and then the request had to come from the medical faculty to me to arrange the course. For the first time this year it has been done. These students thought I would give them a pleasant jaunt to the infirmary, furnish them with forceps, and have them extract teeth. Instead I took them into the lecture room, taught them something of the development of the teeth, and a little bit about normal occlusion, and said that one of the things they must learn is what teeth they ought not to extract as well as those they ought to extract. I showed them some models, and among other things I showed them the model of the mouth of the son of a physician. That physician had learned to extract teeth, and he had extracted his own son's teeth until the son had the worst formed face and the worst case of mal-occlusion I have ever looked upon. That medical man has learned something of the value of dentistry. He is moving heaven and earth to-day, to restore to his own son a face that is at present a blot upon everything that pertains to medical education. I do not say this in disparagement, nor by way of criticism, but I do so simply to emphasize the statement made in this city by Dr. Mayo, namely, "it will be a splendid thing for both medicine and dentistry when medical men know more about dentistry and when dentists know more about general medicine."

Just one other thought and I am done. Dr. Kirk concluded his paper with a reference to the necessity of getting men who would carry out this idea—teachers who would inspire students to go forward with this higher conception of their duty to the public. That is the great problem both in medicine and dentistry, to find men who can teach and who will teach, not the men who can cram into students the greatest number of isolated facts, but the men who will give to the students a knowledge of the fundamental principles, and leave them something to work out themselves. Give them some idea of the dignity of their calling. Teach them that every operation which they perform is to be in harmony with its environment and all that that means. But where are we to find such men? And having found them, where are we to find students who will take the training and go out in sufficient numbers to give to the public the services they demand, as mentioned in the title of this paper? Everybody in the world cannot receive the higher surgical or dental education, just as everybody cannot wear seal coats. The man who sells a seal coat to a person who can afford to pay for it is no more honest than the man who sells a sealette or a near seal, to a person who can only afford to pay for such. But let us teach our students that there is a class of dentistry which can be done and which will render effective service to those who only earn an average wage, and then, if possible, inspire them to go out and do that work honestly. After all, that is the great problem confronting the dental profession today. We all know the very fact that people expect in so many fillings so much alloy and so much gold for a certain amount of money, has prostituted the profession and given to the dishonest man a lever to prey upon an ignorant public. Surely, something can be done in this and in every country which will protect the public from the man who with glaring effrontery puts into the mouths of people a class of dentistry the glaring hideousness of which is only equaled by the glaring unscrupulous dishonesty of the man who practices it. (Applause.)

THE PRESIDENT:

It is rare, indeed, when a community fully appreciates the work of one of its members. It is not easy to stand at the base of a mountain and know much about it. The man who speaks to you next must be a man of quality, because in his own home and among his own people he is greatly honored, and it is a privilege to us tonight, members of the Chicago Dental Society and guests, to have with us so distinguished a man, an international surgeon, as Dr. John B. Murphy, whom I take great pleasure in introducing as the next speaker. (Applause.)

DR. JOHN B. MURPHY:

Mr. President, Honored Guests, and Parishioners of the Universal Church of the Healing Art: As I have to throw myself on your mercy, I feel I can do that better by becoming one of you. It is difficult for a surgeon to appear on a platform after an editor and an orator. (Applause.)

The relationship between surgery and dentistry is a close one; it has always been a close one with me, especially. I was appointed dentist of the dispensary six weeks after I began the study of medicine at Rush Medical College in 1876, so I began as a dentist. From that time, however, up to the present, I have had a very keen interest in the work of the dentist, and this interest has increased in enormous proportions in recent years.

Eight years ago I appeared before this Society and discussed the relationship of oral infections to constitutional disease and made the statement then that many of the constitutional diseases were easily and readily traceable to infections in the alveolar processes and about the teeth. That seems a long time ago, considering the progress which has been made in the last six years.

The able address by Dr. Kirk had reference, first, to the education of the dentist. Why should the dentist be educated in a different room from the surgeon in the essential elements—in his bacteriology, histology, biology, physiology and anatomy? He should not. It is an anomaly. The first two years, as indicated by Dr. Thornton, should be the same with the aurist, the oculist, the surgeon, the neurologist, the internal medical man and the dentist, and until this educational error is corrected there will be no correlation and no co-operation between dentistry and internal medicine.

If one looks over the decades of life, and estimates the periods at which men die, he is struck by certain great contrasts. We all start out in life with possibly not the same physical advantage. We have the advantage or disadvantage of inheritance. It is but a small factor in the scale as far as the continuation of life is concerned. It is, however, an elemental and important factor.

What is the next element that contributes to our continuity of life? Environment. The environment of the youth who is raised in the city as a child, compared with the environment of the boy who is raised in the country in the open air and atmosphere, is very important; but let us follow each of these through the various decades of their termination, and note the change. The boy of the country is young and robust, sturdy and strong, up to the thirtieth year, while the boy of the city is thin and pale, haggard and under-fed, and under-ventilated, so to speak, up to thirty. Watch them from thirty on. Go into any rural community in any country in the world, whether it is in England, in Ireland, in Canada, or in the United States, or in Germany or Austria, or in the Orient, and what do we find? From thirty years on, the man who lives a farm life rapidly deteriorates. He is an old man often at forty, and very old at fifty. The man in the city is well groomed, spry, active. Indeed, he thinks he is in the prime of life at fifty. He is, often. (Applause.)

Let us ask ourselves the question, what are the diseases that pluck out the largest number of lives in the various decades that have led up to the fiftieth year? Take the results in the period in the first ten years and we find they are the bacterial diseases of the acute type; in the next ten, bacterial diseases of less acute type, with tuberculosis taking precedence, and accidents, not of bacterial origin, taking second place. When we come, however, to the second and third decades, what commences to cut in? Not bacterial diseases of the acute type, with possibly the exception of pneumonia, but bacterial diseases of the chronic type. What do I mean by that? I mean heart lesions, Bright's disease, which are just as unquestionably of bacterial origin as is pneumonia.

Now we come into the fourth decade. Here we have the arterial changes beginning; in the fifth decade, heart disease comes into second place, and in the sixth decade it comes into first place, with cancer second and Bright's disease third; and this relationship is maintained to the end. Take these diseases and ask yourself the question, what relation do they bear to the teeth? When do the infective lesions from the teeth begin? When you divide the infective lesions of the teeth there are three classes: (1) The acute lesions that involve the alveolar process alone; (2) the more chronic type of lesion that involves the lymphatic system, the glandular system and the cellular tissue of the neck, and (3) the hematogenous type, and of this type we have two varieties, the acute type, which occurs with acute infections, like streptococcus viridans or the pneumococcus, which causes the most virulent type of blood infection one can possibly have. What is the other type? The type of slow infection from bacteria in the soft tissues of the alveolar process, but more particularly that insidious, deadly, constantly poisoning and disseminating variety that occurs around the tooth roots. This produces many of the chronic lesions that were formerly called metabolic. They are, however, true metastatic disease, and the majority are of tooth origin.

For the last seven years I have been in very close association with the dental profession, and in almost daily contact with members of the dental profession, to support them or disagree as to whether a particular tooth was the cause of the constitutional disease for which the patient presented himself to me, and it is only by the information which I received from that source that I was able to select the cases and say that this case could or could not be relieved by dental methods, and I might add a word from the standpoint of the surgeon, in a humble way, that I am fearful of too liberal extraction of teeth. I feel that it is up to the dental profession to prevent the unnecessary extraction of teeth and cure diseases of the teeth by a local conservative procedure, just the same as it is up to the surgeon to cure lesions of the extremities without amputation. (Applause.)

Just within a week it was suggested to me by the dentist to whom I had referred him for metastatic joint lesion, that a certain man should have all of his teeth extracted, and I said to the dentist, "Consider that seriously." I would consider that as seriously as I would the proposition of amputating three or four of my fingers.

What is the relationship between these infections? There is the closest possible relationship. When, in 1902, we began advocating, from clinical observation as a surgeon, that a joint infection was the sequence of infection in a distant portion of the body, namely, that there was no such thing as "metabolic rheumatism," that every joint inflammation was the manifestation of a metastatic infection from some other portion of the body, it was not accepted by the medical profession, any more than that proposition is accepted by the dental profession at the present time. The medical profession—and I dare say some of the dental profession—could not realize that the disease we had considered so long as a metabolic trouble, namely, joint inflammation, was metastatic. They could understand how beer and beefsteak could go to a joint, but they could not understand how microbes could arrive there. (Laughter.) That was the proposition. Today what has happened to support this clinical position? With the experiments of Rosenow we have found what? We have found that from a single strain of the streptococcus viridans we can develop by cultures in six different media six different types of disease; that we can produce them uniformly almost from each of the varieties of cultures, and we can reproduce them by recultivation, showing a complete cycle of Koch, which was considered so essential in the etiology and development of disease. In other words, we can have trained bacteria. I merely cite this to show the co-ordination of the branches of medicine that must come if the healing art is to obtain for the public the best results that are available.

It seems to me that the departmental proposition of the practice of medicine not only is coming, but is here. I cannot understand how a well-organized clinic today can be without an oculist or an aurist, a pathologist, or a bacteriologist, or a dentist, if the best results for the patient are to obtain, and that the department store plan of medical offices is to be the plan of the future, because the healing art has become such a colossal undertaking, and there are so many interlocking, diverse and intricate complications, that it is beyond the grasp of any man, no matter how much confidence we may have in him, to render the best service to the people in all of its phases.

Another proposition, it appears to me, is that after we have educated the dentist and physician together; after we have practiced side by side, each one will see, as he gleans knowledge from the other, a new method of advancement.

We must not endeavor to educate all of the dentists or all of the doctors as research men. That is the latest fad in the medical profession, and I presume the same holds true with regard to the dental profession. After entering school, shall you become research men? No. The first thing you must do is to learn what is already known in that particular line, and then, if you have the inspiration, the vision or the genius, start out in a new line of investigation, and become a research man. (Applause.) But see to it that the common educational property of your profession up to date is well at your command. How many men are capable of being research men? When you look at the temple of science, it is made up of many arches; each of the bricks in the column has been put in by some unknown and unwritten plodder, but it was essential that they should be put in, so that the arch might finally be completed and permit the man of genius (who is inborn—not inbred) to put in a keystone and on it write his name.

It is the co-ordination of these essential small things that leads to the epoch-making discoveries in science. On that basis we must encourage the highest education of every man in the art, and we obligate every man in the art to support the profession in return, the principle so beautifully expressed by Kipling in his "Law of the Jungle": "The strength of the pack is the wolf, and the strength of the wolf is the pack." I thank you. (Applause.)

THE PRESIDENT:

We have heard from the dean of a dental college; we have heard from a surgeon, and now we shall hear from a man who emphasizes in his activity the art of prosthesis, and we are glad, indeed, to welcome within our gates our friend from New York, Dr. Ellison Hillyer, who will continue the discussion.

.. DR. ELLISON HILLYER, New York:

Mr. President, Dr. Kirk, Ladies and Gentlemen: If Dr. Murphy felt ill at ease in following an editor and an orator, what must be my position following these two gentlemen *and* Dr. Murphy, who is at the summit of the medical profession?

It seems to me as if we had adjourned our National Teachers' Conference from Minneapolis to Chicago, and that the valedictory had been given to that meeting by Dr. Kirk. What we have been considering for the past three days has been leading up to this very essay as a culmination.

This epoch-making meeting has been emphasized by Dr. Murphy in a manner similar to that some years ago in this city in a speech by Dr. Mayo: We are preparing for the four years dental course, and yesterday afternoon, as we adjourned in Minneapolis, we had progressed as far as seemed possible toward an approximation of what we were desiring or that I expected we would approach for some time to come, looking forward to the work of special sections during this year, preparatory to meeting in Philadelphia next year and anticipating then definite results. One year from that time we are under obligation to be ready for the proper education of a student in four years. This idea that you have given us is not new, Dr. Murphy, but that which you have said tonight seems to emphasize the best possible solution of some of our difficulties. The great trouble with our educational institutions, so far as dentistry is concerned, is not so much the spirit that is behind them as the environment in which we are placed. Every year gives us aspirations toward higher and better things. These problems cannot be solved by any local college or by any local society. It is a matter that must ultimately be one that will be assumed by the state and I believe, after having seen what we have observed at Minneapolis, there is no better way that this can be done. There are many factors even in that method which will be weak, for I recognize the fact that there is no such thing as a perfect politician. Unfortunately, it might be that should dental education become part of the state organization, all of the states may not be as fortunate as Minnesota, but still I believe that it is the best method.

Dr. Murphy has referred to his advice to patients. I would like in most beneficent spirit and without any desire to reflect in the least upon medical education to say that *I believe that there is more to be given to the medical student along the lines of dental education than there is to be given to the dental student along the lines of medical education.* I have asked honor men graduating from medical colleges the question, "How much are you taught in regard to oral conditions?" "Very little." A great many physicians know comparatively little about oral conditions yet, as has been indicated by the previous speakers, there is a tendency on the part of some medical men to dictate to the dentist as to what he shall do. A case in point:

Last Friday, when I was about to leave New York, a patient came in, whom I had not seen for a number of years. She had been suffering from some nervous trouble but had quite recovered. During that time she had had radiographs of her whole mouth, the upper and lower arches, and the advice was given to her that all her teeth should be removed. She objected seriously, and came for advice. I could not see, even though years had intervened, that there was anything very serious and I said to her, "Have you had radiographs made of these teeth?" She replied, "Yes." I told her that I would like very much to have these radiographs because I did not have an opportunity at the time to take them. I told her I would take these radiographs to Minneapolis and show them to men who are authorities and report the result of their interpretation of the radiographs to her. The men to whom I have shown these radiographs are expert interpreters of radiographs and unanimously agreed it would be a crime to take out these teeth, and that, while there are certain conditions of slight infection yet, as far as the radiographs show, they can probably be very easily cleared up.

Dr. Brophy reported a similar case in a discussion of this subject at Minneapolis, in which a single root removed practically cleared up the condition. If the education of the medical student should be broadened and the education of the dental student be broadened that broad base should be made the foundation of both, with pinnacles built on the lines of each. I believe then we shall have what Dr. Murphy has referred to.

I am delighted to have heard Dr. Thornton say that this method has prevailed to a degree in Montreal. I never heard him say that before and did not know that it was so. If this method were followed in general it would be a great improvement. Just how it is to be done remains for time to tell. It is one of the great problems which Dr. Kirk has set forth in his paper.

Dr. Thornton has referred to service to the poor and that also is a great problem. It is a problem, I believe, that must be a part of this whole subject. It is bound to, because there is bound to be more extraction of teeth, if we are to follow out the lines we are working upon now. We have been preserving too many teeth, due to our desire for conservation. We know it now, and there are cases where we are removing teeth which we would not have done ten or fifteen years ago. In the restoration of these it is a question as to how it is best to be done.

The condition that confronts the dental profession today is similar to the condition that confronted the profession of Great Britain in 1878, when the government set the standard so high that comparatively few could practice dentistry. In fact, it was upon exactly the same plan as medicine. What was the result? It cost a student from $800 to $1,200 a year to gain his education, to say nothing of his subsequent apprenticeship and the cost of such apprenticeship with a practitioner. The result is that to-day there are *5,000 licensed* practitioners of dentistry and *20,000 unlicensed* practitioners in Great Britain, because it is a difficult matter for a man to obtain an education.

I inquired of Dean Owre the other night whether with seventy-five dental graduates a year in his college and possibly fifty graduates added from outside sources, making a total of one hundred and twenty-five, would that number of men coming into the State of Minnesota take care of the people who are demanding dental care in Minnesota? I think we all agree that the demands for dental care are growing greater and greater every year. The public, both rich and poor, are coming to understand what they want and what they must have.

What do the school children learn today? They are inspected in many cities and are told they must have certain work done or they cannot go on with their study. Who is to do this work? I am not prepared to answer that question. It is one of the unsolved problems and one that must be read between the lines of Dr. Kirk's essay.

I have enjoyed exceedingly the pleasure of being with you tonight and hope that the incentive that will be given by the events of this week will find its culmination in great results in the future. (Applause.)

Thomas L. Gilmer, Chicago:

The essayist has given us a most excellent paper on a subject pertinent to the times, a subject which has interested many thoughtful minds of the profession for years past. Recent developments definitely connecting oral infection with various systemic disorders have already accentuated thought in relation to dental education. We have arrived at a time when wisdom is necessary to determine what shall be done to place dental education on a foundation which will give sufficient stability to stand the test of the new enforced requirements. In order to do this reorganization seems imperative since the present status of dental education does not satisfy the demand. There is need, as indicated by the essayist, for greater breadth. To accomplish this there must be a widening and readjustment of the curriculum, so shaping it that no one part may be out of proportion to any other part. As Dr. Kirk has indicated, the mechanical side of dentistry (and the artistic might be added) has been developed to the sacrifice of the fundamentals, producing not a symmetrical but an asymmetrical whole. Unfortunately many applying for admission to dental schools have a wrong attitude of mind as to what dentistry is. Their eyes have been wrongly focused, a sort of mental strabismus prevails. Their conception of dentistry is that it is largely a high grade artistic jewelry pursuit in which anyone with moderate attainments may find lucrative employment. Where does the student get this conception of dentistry? The answer is not difficult. It comes from the graduates of the dental schools whose opinions are largely molded, I fear, by their alma mater.

Mechanics are necessarily important factors in dentistry as they are in surgery, ophthalmology, and some other branches of the healing art; but in surgery mechanics do not subordinate anatomy, physiology, bacteriology and other basic studies. All of these are integral parts of dental education and the curriculum of the future must recognize this fact if it is to be considered as a part of the healing art. Disease of one part of the human anatomy differs from another part only in its relation and the tissues involved. To understand pathology of the mouth and jaws one must comprehend general pathology.

We speak of dentistry as a specialty in the healing art, which is indisputable, then immediately contradict the statement by calling it a separate profession. Dentistry is either one or the other. If it is a specialty in the healing art, then dental education could best be obtained in a medical school. Some have always thought that this was the proper method, and the recent increased demands on us for broader medical knowledge seems to justify more fully their belief. That there are serious difficulties in the way no one can deny, but that there may be worked out a plan by which it may be accomplished seems within the range of possibilities. If this is found to be impracticable at present, then dentistry must at least, and at once, rearrange the curriculum so that there will be no difference in the amount of the fundamentals demanded of the dental student to that demanded of the medical student, since after all it is not so much a matter of the medical degree that should be sought for but rather the intrinsic value of the education obtained.

The essayist speaks of friction between the physician and the dentist. This will exist so long as the members of the healing art entertain the belief, which we must regret largely exists, that dentists are poorly equipped in pathology, bacteriology and other branches of medicine. When it is generally understood that dentists know as much of the relationship existing between diseases of the jaws and mouth to other parts, as the rhinologist does of the nose and throat and their accessories, to other parts, then, and not until then, will they refer patients to the dentist for diagnosis of mouth foci with the same confidence that they do when they refer patients to other specialists. It is not to be expected that those practicing internal medicine, or any one of the other branches of the healing art, should be equally conversant with the work of all other specialists. The field is too broad for any one individual to know all special pathology equally well, and each specialist must call to his assistance at times others of the family for special knowledge to assist in arriving at definite conclusions, and dentists must qualify for this more fully.

Physicians are not justified in dictating to the dentist who is *fully qualified,* the special treatment to be used for the removal of focal infection in his (the dentist's) special field. The greatest harmony should prevail between all branches of the healing art, and it is only by such harmony that the greatest good will obtain.

The essayist said that medical men should have more special knowledge of diseases of the mouth and teeth, which is true, and there is evidence, since they have discovered that focuses of infection in the mouth are responsible for systemic disorders, that they are becoming more conversant with diseases of the jaws. If students of dentistry and students of other branches of medicine could be educated in the same schools and largely in the same classes, the graduates as a whole would be men of broader views and more capable, and the friction mentioned between dentists and other specialists would not be in evidence.

If this proves to be impracticable at this time, then we must gain at least something of the greater breadth so much needed, by the profitable use of the extra year of work which will soon be inaugurated in the dental schools. If this extra year is wisely utilized it will in part at least accomplish the end desired. It would seem that there can be little doubt that one of the four years should be spent in the university proper in study especially designed for subsequent work in the dental school.

DR. EDWARD C. KIRK, Philadelphia (closing):

I want to explain, in the first place, what perhaps you must have derived from listening to the paper, that it was intended merely to be suggestive, to direct our thought toward what has seemed to me and to a great many to be one of the most important problems which has yet confronted us in dental education. I was not able to include in the title of the paper all that I wished to convey regarding the public demand in the matter of dental service, and I quite realize, as one of the discussers of the paper has said, that the public, generally speaking, are too ignorant to demand the right type of service from the practitioner. What I intended to imply by that phase of the title is, that the public has the right to demand the best that we can offer in the way of service in the light of our existing knowledge.

One more point I wish to refer to is this: I fear that I have developed to an unfortunate degree the gentle art of making myself misunderstood at times, and I do not wish to misrepresent myself upon one important point upon which I touched when I said I thought one of the most important things that we needed to do today was to reorient our minds with reference to the position of mechanics in its relation to dentistry. I did not mean to imply that we are to have less mechanics, nor did I wish any of my colleagues to infer that I belittle the importance of mechanics. Anybody that knows me knows the admiration I have for genius along mechanical lines. I was determined to refer to this matter when I came to that phase in my paper and saw in front of me the venerable face of that perennially young Nestor in dental mechanics, Dr. L. P. Haskell, of Chicago. (Applause.) I want to say in his presence and for the craft that he adorns, that I bow in reverence to what he has created, what he has accomplished and all that has been properly accomplished in the high development of dental handicraft.

Some of you may have been present in Paris in 1900 when Dr. Joseph Porter Michaels exhibited a patient of Pean, the great French surgeon, a case referred to in a recent paper by Dr. Murphy, for whom an artificial shoulder was inserted. I had the opportunity to see the mechanism itself in the cabinet of Dr. Michaels, and I had from him a verbal account of the almost mental struggle he went through to devise the mechanism which made that universal joint possible. It was a wonderful result. The man some years afterwards died, I do not know from what, but he had a tuberculous joint infection in the first place for which the operation in question was performed. The success of the operation depended upon two things: the coöperation of that skilled mechanical genius who produced that mechanism, and the technical skill and aseptic care exercised by that splendid surgeon Pean. The operation would have been a failure if it had not been mechanically perfect, and it would not have been surgically perfect if the mechanism had been placed in infected territory. We should place our mechanical restorations in harmonious relationship to the vital parts to which they are applied. We must always ask ourselves the question, no matter what the operation may be, what will be the vital reactions towards this mechanism? We must not be in a position of presenting to the tissues what Professor Adami has happily designated as a "physical insult." That means reorganization of our whole mechanical technic with reference to the principles of aseptic surgery. It is in that respect that we must reorient our thought and reconstitute our ideals. I yield to no man in my admiration of the things that have been accomplished along mechanical lines by the members of the dental profession, but we all know to what an extent badly conceived and badly executed mechanical operations have been in evidence in the past with respect to the vital relations of that mechanism.

I said to Dr. Murphy just now, "You have made history tonight, sir." That is what I think has happened. This "ugly duckling" of dentistry, as our friend James Truman called it, is coming into its own through the realization of its important relations to human life and health. We had gotten away from the fold, but the tendency is to return to our normal place in the science and art of healing and the old mother hen seems inclined to look upon us with more sympathy than she has done heretofore.

I wish to express my cordial appreciation of the hospitable Chicago reception I have received from you this evening and the more than generous treatment I have received at the hands of those who have discussed this paper. I shall go back to the city of my adoption, because I was born in this state, feeling it has been worth while to come back to Illinois to renew my inspiration. (Applause.)

At the conclusion of Dr. Kirk's remarks, Dr. Arthur D. Black said: Most of you here tonight recall three notable papers which have been presented before this society, and it so happens that they have been presented at intervals of three years, six years ago by Dr. Murphy, three years ago by Dr. Mayo, and tonight by Dr. Kirk. All three of these papers have had a definite tendency in the same direction, and they have been, I believe, three epoch-marking papers not only in the history of dentistry of the west, but in the history of both dentistry and medicine of the world, and I rise to ask the members of this society and their guests to extend to the essayist of the evening, Dr. Kirk, on account of the many years of service which he has devoted to dental education, on account of the many years with which he has been occupied in the studies which have enabled him on this occasion to direct our thoughts to the higher things of the future, a rising vote of thanks.

Motion seconded and unanimously carried.

THE ST. LOUIS DENTAL SOCIETY.

DISCUSSION OF THE PAPER BY DR. D'OENCH ON "SOME OBSERVATIONS ON BRIDGEWORK."

Dr. W. A. Chamberlin:

I want to say in opening that Dr. Hageman claimed to be authorized by Dr. D'Oench to extend to the discussors the invitation to criticize this paper and go as far as we liked, and after reading it there seemed to be embodied in it the opportunity. Instead of a treatise on bridgework it seemed to be a very detailed exposition on the inlay abutment.

Some observations on bridgework by so capable a man as our essayist would naturally lead one to conclude that it would be a summing up of his extensive experience and observation, bringing out the essential from his standpoint and cautioning against the uncertain. And I am very sorry we could not have the benefit of his observations.

I wish he had helped us to come to some conclusion on better dentistry in bridgework as has been done in cavity preparation, the use of amalgam and the treatment of teeth under bridge caps.

In the preparation of cavities the profession has recognized a theory that defines certain lines to which to cut. It is the straight and narrow path and it is only experience and time that should qualify a dentist from straying or modifying it. So it is the consensus of opinion of the profession and is considered better dentistry for a tooth carrying a bridge cap to be devitalized, pulp removed and roots filled. It is also agreed that amalgam put into a cavity under pressure makes the best filling. Such packing will necessarily bring about a better mix, better placed matrix and might be expressed as the key to the making of the best amalgam filling.

It is such a consideration of bridgework that I wish Dr. D'Oench had given us and there is no doubt in my mind that he is capable of doing it.

There was a time with us older practitioners when we were in a maze concerning the character of bridgework to employ—when we were prompted to give the very best service but were not certain of the straight and safe course to pursue. We could see objections and reasons for employing the regular method of pin facing with gold cusps, of saddle bridges with all porcelain detachable crowns, of making an open-faced crown, of post anchorage inlays or inlays without posts, complete excision of anterior teeth with Richmond crowns, spurs supporting one end of a bridge and of detachāble facings.

It led to the adoption of some one method and we waited with uncertainty for time to tell of the success or failure of our judgment. How valued would have been the observations of some older and more experienced practitioner.

As it is, the older men have gone the gamut of types and styles of bridges and have learned through experience and observation what to employ and what not to employ.

Of what avail is dynamics in bridgework? In my opinion, of no use. Beyond the interesting fact that the human jaw is capable of exerting a force of 300 pounds and that in ordinary chewing a force of from 30 to 60 pounds is employed, there can be no application of it because of the varying condition of the carrying power of the roots.

Roots may be overloaded, so of what use would the knowledge of the crushing strength of bridge material amount to where the bridge was swung from one third molar to a lateral incisor or a bridge of 14 teeth swung on three roots? Bridges built to give sufficient contour and of chewing surface, regardless of any other consideration, would be strong enough to overwork the roots and result in the failure and loss of the work.

If the roots were of steel embedded in concrete, then the force of bite, stress of materials, etc., could be worked out and employed to some practical advantage in each case.

Is there any other way than experience in determining the carrying power of bridge roots and the strength of bridge construction? Experience and observation—the observation of the other fellow's failures are the only way.

"Some observations" should have meant observations which spell success and observations which spell failure. Dr. D'Oench could have given the sailing course to the young mariners in the sea of Dentistry, charting the dangerous places and marking the safe channels, while at the same time confirming the opinions of some who were not quite sure.

NORTHERN ILLINOIS DENTAL SOCIETY, FREEPORT, OCTOBER, 1915.

DISCUSSION OF DR. BENTLEY'S PAPER ON "FACTS, FADS AND FANCIES CONCERNING PYORRHEA."

Dr. T. L. Gilmer:

We have listened to a well written paper dealing in a forceful manner with a subject which is timely.

The facts known about pyorrhea alveolaris are few, the fads and follies connected with the disease are many. About all we know of pyorrhea has been gained from observation of its clinical manifestations. We know that the disease is very prevalent, that it is difficult, if not impossible, to permanently cure it by any known method of treatment. The essayist has very definitely shown to us that not a few dentists are faddists. Some dentists, like the ball-bearing weathervane, are turned this way and that by every little theoretical zephyr that passes by, no sooner do they drop one fad than they take up another. The wake of the professional career of such men is strewn with discarded fads. Among these faddists is one class that is especially reprehensible. I refer to those who are faddists for revenue only. We all know some such. They are not scientific in any sense. They are not students and naturally have no just claim to special knowledge which they assume to themselves. Some of these are rather clever in their deceptions. In time they all overreach themselves and drop into oblivion.

Follies are not in the same class with professional fads. We must all answer in the affirmative to the charge of having been guilty at times of professional folly of some kind. Through error in premise one may be guilty of folly, and in many other innocent ways, but the faddist is far more likely to be guilty of folly than are thoughtful students.

When scientists have discovered through research the cause of pyorrhea alveolaris the cure will in all probability be worked out, then and not until then will the pyorrhea faddist cease to exist.

We must not be too critical of those who have earnestly tried to work out difficult problems even if time does prove that their work has been doine in vain. Such men should not be ridiculed, but rather sympathized with and encouraged in additional efforts. While I deprecate the too hasty conclusions and too positive statements made by some relative to the cause and cure of pyorrhea alveolaris, credit should be given for all earnest work and hope entertained that good may come from such labors. All work done by capable men with good intentions in pursuit of scientific facts generally develops a modicum of truth which brings us just that much closer to the goal. Though there be no great gain in positive truth from such work it helps by eliminating the necessity of further effort in unprofitable fields, which of itself is beneficial.

It is unfortunate that Bass and Johns and others have been so positive in their statements relative to the cause and cure of pyorrhea alveolaris, since as the essayist has indicated they have held out a forlorn hope to those suffering from this disease, which when blasted, reacts against the profession. These positive statements have led some very good men astray. For instance, Dr. W. A. Evans in his column in the *Chicago Tribune* on "How to Keep Well" accepted Bass' and Johns' statements at par value and reiterated the statement that amebas are the cause of pyorrhea and that some form of ipecac is specific for the disease.

In order to verify or disprove the statements of Bass and Johns, I made a series of experiments and found as they did amebas present in almost all pyorrhea alveolaris pockets. I also found that the protoza disappeared following the use of emetin hydrochlorid. In addition there was improvement in the patient's oral condition. You will agree with me that so far Bass' and Johns' statements appear to be substantiated. But I went a little further, I examined mouths free from pyorrhea and here likewise I found amebas. I also found after the lapse of a few weeks following the use of the aforesaid drug on those of the series which had pyorrhea, that amebas were present even as plentiful as before, also that the improvement observed in such mouths had relapsed into a condition quite as bad as before the emetin treatment.

As to the mercuric succinimid treatment of pyorrhea by Wright and White, I am quite willing to believe that any form of mercury may temporarily be helpful. We all know that mercury has a special affinity for the gums and peridental membrane. I have often used small doses of calomel frequently repeated in the treatment of pyorrhea and have noted beneficial results.

While Bass and Johns and Wright and White may in the main be wrong in their premises, and conclusions, may we not extract something from their labors that may be helpful? It may be that pyorrhea alveolaris is not wholly local in its origin, but that there may be some systemic fault not yet recognized to which in part at least the disease may be attributable, and if so, may not the emetin or mercuric succinimid be helpful as an adjunct to local treatment?

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EDITORIAL.

EXPLOITING THE PEOPLE.

If this profession of ours is not very careful there is coming a time when we will be a by-word in the land. The beautiful old traditions of the past regarding professionalism and high ethical standards—traditions fostered by such men as Jonathan Taft, William H. Atkinson, W. C. Barrett, W. H. Morgan, George H. Cushing and scores of like character—will become a fable and a myth in the minds of the coming generation of dentists unless a halt is called on some of the tendencies of the present. The whole end and aim of some men in the profession who pose as respectable and ethical practitioners seems to be to exploit the people. With one fad after another they prey on the credulity of the public, till even the public, long-suffering and gullible as it is, is beginning to murmur a protest.

The professional conduct of dentists should be such as to inspire the utmost confidence on the part of the people. The people come to dentists and place themselves in their hands for service the character of which the people are admittedly more or less ignorant. There is consequently a moral obligation on the part of the dentist to conserve the welfare of the people in every conceivable way, and not to take advantage of the fact that the one receiving the service is in no position to judge of its ultimate benefit or its harm. When this obligation is lived up to in its fullest sense the people develop a respect for the profession, and the relationship between the two is mutually satisfactory.

But what shall we say of some of the recent tendencies where patients are made victims of all sorts of foolish practices? We have due consideration for the mistakes which are frequently made by professional men who are trying out new methods of practice in a conscientious manner, but who fail of making good with their ideas. Much of this testing out process must necessarily result where new things are brought forth as rapidly as they are in dentistry, and a formidable percentage of the things tried must turn out a failure. It is the penalty of progress that we try and fail, and try again and again till we succeed.

This is well and good provided we do not deceive the people. But when we seize every new fad and herald it from the housetops that the dental millenium has come and a panacea for all the dental ills of humanity has been found, then we do a deliberate wrong; because we know in our hearts, if we are honest, that the millenium has not come and the panacea has not been found.

Worse yet, if we take methods of practice which in their place are legitimate, and rename them with some hifalutin title and employ them willy-nilly, right or wrong, just for the purpose of impressing the public, we sin grievously. For instance, a porcelain jacket crown under its proper indications is an excellent thing, and its use is legitimate. When it is completed, the patient may say in viewing it with much satisfaction: "Why, that's like putting new enamel on a tooth." Instantly the practitioner seizes on the pat phrase and announces to the world that he "re-enamels" teeth. The cases where he can by any ingenuity use jacket crowns being very limited, he contents himself with inserting the silicate cements in cavities in the anterior teeth and calls it "enameling teeth." It is a wonderfully fetching phrase.

The lure of analgesia was worked to the limit, in some quarters wholly conscientiously, in others with the sole idea that it was a "practice builder."

And now oral prophylaxis—God save the mark! To what depths it has been dragged those only know who have suffered from its extremes. A perfectly legitimate practice when used with reason and discrimination, but used as it is by some today it is nothing short of downright desecration. To grind enamel in the wanton way that some are doing it, to obliterate all the anatomical markings nature placed upon the teeth, to insert a sandpaper strip in the interproximal spaces and particularly between the bifurcation of roots of molars and saw back and forth as if working on an inanimate object cannot by any stretch of the imagination be called good practice. But it is impressive to the patient. Shortly after such treatment in many cases the mouth looks healthier. It may be the first time the individual has ever had his teeth really clean, and there is a sense of wholesomeness to his mouth. It appeals to him to be told that "all the poison is being taken away from around the teeth"—an actual phrase used with certain patients. He is comforted by the assurance that his teeth will "never decay any more."

And here lies the chief and abiding harm. The wrecks in the path of this sort of treatment in a few years will be appalling. The damage done not only to the mouths of the patients, but in the way of destroying the confidence of the people in dentists and dentistry will react most unfortunately. A laudable method of practice will be dragged in the mire and people will lose faith in the efficiency of keeping teeth hygienically clean.

And so we might continue. The half has not been told about the schemes to exploit the people, and unless there is a halt the profession will one day receive as its just desert a baptism of sackcloth and ashes.

THE EDITOR'S DESK.

THE GREAT AMERICAN CRIME.

If a dozen individuals were seated side by side and asked the question in rotation: "What is the great American crime?" it would be interesting to note the various answers. One would probably say, "Worshiping the dollar," another "Superficiality," another "Rudeness." We might expect several to answer that the great American crime was the practice of lynching, while several others might supplement this by affirming that the great crime was lack of respect for law and order. At least one would be found to affirm that snobbery was threatening to assume the proportions of a crime, while the apeing of aristocracy always has been one. Some might go so far as to say that the absence of culture as represented particularly in the widespread ungrammatical speech of the people was a crime, while others would point to a lack of taste as illustrated by the blatant display of wealth on the part of the newly rich.

Possibly there might be ground for argument in the case of each, and yet to the writer there is one American crime which outweighs all of those mentioned. Greatly as reform is needed in the various American tendencies indicated there is still more urgent need for reformation in the one about to be mentioned. Of all the crimes typified in American life the one outstanding and appalling crime is that of *Wastefulness*.

I have before in these pages referred to this question of waste but it will bear repetition on account of its almost universal prevalence. It permeates the entire fabric of American life to the degree that it constitutes itself nothing short of the national crime. It affects the poor as well as the rich, and in fact it would sometimes seem to be even more prevalent among the former. And it is all wrong. To be wasteful is not the right of any man. Waste in its essence is destruction, and to destroy is a sin.

Waste takes many forms. It is not merely the throwing away of a crust of bread or relegating the drippings to the garbage can. It is not alone the failure to utilize the usable in our domestic and manufacturing commodities (a waste which in many of our industries is rapidly being eliminated). It is not wholly the terrible waste represented by an imperfect cultivation of the soil—a waste which on the surface seems to stand out above all others. It is not only the waste of our forests—the precious heritage of which has been handed down to us by a beneficent nature, and which we have in our criminal wantonness and greed flung to the four winds, and committed to the needless flames.

All of these are bad enough and sad enough. They clamor for reform at each turn of the observant economist, and unless they are remedied the penalty on posterity will be irreparable. But the worst is not yet.

If there is a sadness in the waste of material things, what shall we say of those other entities of human existence, the waste of energy, of opportunity, of constructive effort? What shall we say of the loss of human life by preventable diseases in this country in one year? The Health Department of Chicago estimates that in this city alone the cost of three preventable diseases, measles, diphtheria and scarlet fever, for the single year of 1915 amounted to

$6,569,207!! Measured in the sordid estimate of dollars and cents alone the toll is appalling; but measured in terms of grief and care and blighted hopes, of thwarted plans, of cancelled enterprises, of cruel disappointment, of broken hearts and barren homes—measured in the terrible toll of human misery, and it is staggering. When shall the agonized cry of the bereaved which goes up day by day reach the ears of the people so that they may learn how to live and prevent this unnecessary waste of human life?

And then the waste of health, energy and efficiency in the child labor of factories and sweatshops—a waste which became so appallingly apparant that it is now in a fair way of being eliminated by legislation and restriction.

And the other waste more grievous and unjust than all the rest—trying to remedy a wrong of the past by substituting a worse wrong of the present—the restriction of trade and commerce by unwarranted strikes where nothing is at issue except a quarrel among the walking delegates themselves, depriving respectable citizens of rights and privileges which properly and inherently belong to every human being, ignoring every principle of law, honor and justice to carry out some selfish end.

But why multiply? And to go further, why confine this horrible crime of waste to America? Look at Europe today, and behold such a spectacle of waste and desolation and unnecessary woe as was never exhibited in the history of the world before. Compared to the waste of America this waste of Europe is as a mountain to a mole hill. Out of this great sinfulness of waste at home and abroad must come some good, and yet as we see the terrible upheaval of humanity going on today we must exclaim with the prophet of old: "How long, oh Lord, how long!"

BOOK REVIEWS.

DENTAL STATE BOARD QUESTIONS AND ANSWERS. By *R. Max Goepp, M. D.*, Author of Medical State Board Questions and Answers. Second Edition, Revised. Octavo volume of 428 pages. Philadelphia and London: W. B. Saunders Company, 1916. Cloth $2.75 net.

As a means of reviewing a subject by students previous to state board examinations this book will be found valuable. If used for this purpose only and not as a means of obtaining knowledge originally without the study of textbooks it will answer a useful purpose. Manifestly the student in properly preparing himself for future practice requires more detailed information than can possibly be given in the necessarily brief answers recorded in this book, and yet there is always with every student the temptation to take a short cut, which in this instance is represented by merely learning in a parrot-like way the stereotyped answers to questions. There is one service which we trust the book may be successful in performing, viz.: to induce students to answer questions in a clear and precise manner without too much verbiage and waste of words. The answers in Dr. Goepp's book are clear, concise and strictly to the point, which is an excellent example to set before students. For briefly refreshing one's memory on any particular topic the book will prove of service not only to students but to practitioners as well. For this reason it is a very interesting volume to pick up at odd moments, and it should be kept conveniently at hand in every dental library.

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PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Crowning Short Roots:—Additional anchorage may be obtained in crowning those short roots where the band is not sufficient retention, by casting the cusp and allowing the cast to extend down into the pulp chamber which has been squared to receive it.—*E. J. Perry, Washington, Iowa.*

To Protect the Handpiece From Moisture:—Soft rubber polishing cups, size A or B, placed on a bur, polishing brush, or stone, will fit over the nose of the handpiece and prevent grit or saliva from working into the mechanism of the instrument.—*George A. Randolph, Sioux Falls, S. D.*

After Extraction:—After the extraction of all decayed roots and teeth which cannot be restored to health, it is a very good plan to press the alveolus together antero-posteriorly with a finger and thumb, placing the finger and thumb before so doing in alcohol to keep the area surgically clean.—*Walter G. McGauley, Boston, Mass.*

To Increase Fees:—A prominent, successful dentist told me some time ago that if I would go over my accounts carefully each month while making out statements, and raise every charge that I could conscientiously, that I would not only increase my income materially but would acquire the habit of getting better fees.—*J. F. Nelson, Washington, Iowa.*

To Clean the Saliva Ejector:—The saliva ejector often fails to work because the needle valve in the fixture near the bowl has become clogged with lime salts from the saliva. Remove the part containing the needle valve, put a drop or two of hydrochloric acid in the tube and run a fine wire through the valve. Wash out, replace and watch the cuspidor spin.—*C. M. C., Chicago.*

Facility With the Card System:—If a card system is used, have the patient's card taken from its container, placed where the operator can refer to it before starting work for the patient. The operator will thus be enabled to proceed intelligently. The card should not be replaced in the container, until a charge has been made, for the operation. By using this method no charges will be overlooked.—*Albert E. Converse, Springfield, Ill.*

Obtunding Sensitive Cavities:—In case of a sensitive cavity the best results may be obtained by flooding the cavity with the liquid of Justi's Insoluble Cement and letting it remain about a minute. With the cavity still moist with the liquid the sensitive dentin may be removed with very little pain. After a layer is removed and the cavity becomes sensitive again make another application. By this means most cavities may be prepared practically painlessly.—*F. J. Patterson, Mendota, Ill.*

Backing Facings:—Grind facing to position, allowing for enough thickness of gold at incisal edge, apply 38-gauge 24-K. gold backing to facing and hold into position by shaving down the platinum pins with sharp knife instead of bending pins down into backing. Cut a piece of 26-gauge clasp plate the size and shape of incisal shape of facing. Place this in position on the incisal slope and solder. This provides for an even thickness of clasp metal at the incisal edge, which will not easily wear out by mastication.—*W. O. Fellman, Oak Park, Ill.*

Controlling Gums While Making Coping:—The "screw post" manufactured by the Blue Island Specialty Company is a very useful little device for holding gutta percha in place against the end of a root that has been cut under the gum margin for a dowel crown. The root is dried, gutta percha warmed and pressed into place; the "screw post" is then heated by holding in flame with pliers, and forced through gutta percha into root canal as far as it will go. The head of the screw is then covered with gutta percha and the gums pressed back. This should hold the gums well out of the way till next sitting.—*D. N. Lewis, Lake Forest, Ill.*

Cement Slabs:—Instead of having only one cement slab which must be cleaned between each patient, thus taking time during the busy hours of the day, have several dozen slabs cut from window glass. As one is used place it out of the way in a drawer. Have one receptacle for clean slabs and another for used ones. To clean the slabs place them over night in water and in the morning most of the cement will have fallen off. Rinse and place again in clear water slightly acidulated, and they will soon be clean. Rinse in hot water and dry, ready for use. The cut edges of the slabs should be polished smooth by a method to be outlined in a future issue.—*J. T. Search, Onarga, Ill.*

To Solder Conveniently With a Gasoline Blow-Pipe:—In rural districts when a Bunsen burner is not available, a very convenient method of soldering with gasoline is to take a Mowbrey wrench of good size and use this as a vise to grip the gasoline blow-pipe. The wrench should be laid flat on the table and the nozzle of the blow-pipe up. The outfit is movable anywhere and at any time within range of the rubber tubing and bellows. Such an arrangement makes a good Bunsen burner, and it gives the operator the free use of his two hands which is so often necessary in soldering, especially regulating appliances.—*E. L. Burroughs, Edwardsville, Ill.*

Easy Method of Taking Wax Impressions for Gold Inlay:—Cavity prepared upon general plans for gold inlay work. Taggart's wax (or any good wax) warmed over flame till one end is quite soft enough to take form of cavity easily, and the other end rather rigid; then force into cavity by hand pressure, not allowing the patient to bite down on it. When cool remove without doing any carving. Mix small portion of Taggart's investment compound (or any good investment), insert or place it into wax impression just where the tooth was. When investment is set hard carve wax down to investment tooth, leaving the wax in cavity, then carving the details. Insert sprue in usual place, and put all into water for a few minutes to hydrate. Then invest just the same as if no first investment were there, and cast the usual way. Advantages are, first, wax so used can be forced into every detail of cavity; second, leaving entire bulk of wax gives handle to remove impression without distorting wax; third, easier to carve wax out of mouth than in and gives a better chance for detail carving without distorting.—*P. A. Pyper, Pontiac, Ill.*

MEMORANDA.

ARIZONA STATE BOARD OF DENTAL EXAMINERS.

The next examination of this board will be held in Phoenix on October 9-15, 1916.—Eugene McGuire, D. M. D., Secretary, Noll Building, Phoenix, Arizona.

NEBRASKA STATE DENTAL SOCIETY.

The Nebraska State Dental Society will hold its 49th annual meeting May 15, 16, 17, 18, at Lincoln. Headquarters will be at The Lindell Hotel.—H. E. King, Sec'y, Bee Bldg., Omaha.

THE SOUTH DAKOTA STATE DENTAL SOCIETY.

The thirty-fourth annual meeting of this society will be held at Sioux Falls on Friday and Saturday, May 12-13, 1916.—Fred Armstrong, Secy., Sioux Falls.

TEXAS STATE BOARD OF DENTAL EXAMINERS.

The Texas State Board of Dental Examiners will meet in regular session on Monday morning, June 19, 1916, at the High School Building, Dallas, Texas. No diplomas recognized; no exchange of licenses with other states. The fee of $25.00 should be in the hands of the Secretary not later than June 15th. Official application blank and other information sent upon request. —C. M. McCauley, Secretary, 840 Wilson Bldg., Dallas, Texas.

THE FORSYTH CUP.

Dr. W. W. Belcher, editor of *Oral Hygiene,* writes that more than $500.00 has already been received toward the Forsyth Cup Fund, and that he feels certain of $1,000.00. He gently hints—heaven bless him—that Chicago up to date does not shine conspicuously on the list. This will not do. Chicago must furnish her share. All he asks is 25 cents from each member of the profession. Just slip a coin in an envelope and address it to Dr. W. W. Belcher, 186 Alexander Street, Rochester, N. Y. "Do it today."

DR. GILMER'S APPOINTMENT.

After having the deanship of the Northwestern University Dental School offered to him more than six months ago, and having persistently declined all that time through innate modesty, Dr. Thomas L. Gilmer has finally yielded to the wishes of his friends in the university and has accepted. We offer our congratulations to Dr. Gilmer, and particularly to the university authorities on this appointment. No man in the profession is more highly respected than Dr. Gilmer, and no man is more worthy of respect. He is a fitting successor to the late Dr. G. V. Black, whose intimate friend he was during his professional life time. Our best wishes go to the new Dean, and to the school.

THE FIRST ANNUAL REPORT OF THE FORSYTH DENTAL INFIRMARY FOR CHILDREN.

This report has just been received through the kindness of the Director, Dr. Harold De W. Cross. In many ways it is a revelation as to the extent of the service rendered to the children of Boston. The clinical statement gives the average daily patients as 413. The record of the operative clinic is as follows: Fillings, 74,062; treatments, 38,359; prophylaxis, 15,983; dismissed, 7,719; total visits, 84,259; and total operations, 128,404. This is for the year 1915, and it is a wonderful showing. It is doubtful that even the Forsyth Brothers themselves realized the extent of their benefaction when they started it. It is an institution to which the entire country may point with pride.

LAKE CHARLES LOVES COMPANY

The Louisiana State Dental Society will hold their annual meeting in Lake Charles, one of Louisiana's most picturesque cities, beginning May first, and running through until the third day of the same month. An exceptionally unique, interesting and instructive program has been arranged, and all visiting ethical dentists as might desire to attend are cordially invited. The date of the meeting has been so advanced in order that exhibitors will not find the dates conflicting with those of the neighboring states, and that nearby dentists will be able to take advantage of this splendid meeting.—J. Crimen Zeidler, Secretary, Suite 1129 Maison Blanche Bldg., New Orleans, La.

THE LITERARY WORK OF DR. GARRETT NEWKIRK.

As all the profession knows, Dr. Newkirk has done a great deal of fine literary work outside of dentistry. Just now he is publishing serially in a syndicate, "Aesop's Fables Retold" in rhyme—with illustrations, and they are being exceedingly well received. In addition to this he is running a series of articles in *The Pasadena Star* entitled "Worldwide Views," which for grasp of the prevailing tendencies of the day compare most favorably with the best magazine articles in our big monthlies. If men like Dr. Newkirk were not so greatly needed in dentistry we would be tempted to wish that he might be prevailed upon to spend all his time and energy in literary work. The world would be the better for it, but we would miss him in the profession.

THE ST. JOSEPH COUNTY (INDIANA) DENTAL SOCIETY.

This society held a memorable meeting at South Bend, March 13, 1916. They invited dentists from the surrounding districts and also the members of the medical profession so that they had fifty dentists and fifty physicians. They gave them all a dinner and entertained them royally—no mean effort when it is remembered that the society has a membership of only twenty. Then they had as essayist Dr. W. H. G. Logan, of Chicago, who presented a paper on "Points in Diagnosis of the More Important Diseases of the Mouth that Are of Interest to the Medical and Dental Professions." The paper was fully discussed by members of both professions and a very profitable evening was spent. The St. Joseph County Dental Society has set an example for other local societies to follow, and much credit is due to the chairman of the program committee, Dr. John A. Stoeckley, who was instrumental in securing Dr. Logan as essayist and who worked hard for the success of the meeting.

TO THE EDITOR OF THE DENTAL REVIEW.

We wish to express our regret for a most unfortunate incident that happened in publishing the proceedings of the Minnesota State Meeting in the February number of our Journal.

Through an oversight on the part of the committee in charge, the stenographer's report of Dr. Elmer S. Best's discussion was not sent back to him for correction and as a result the manner in which it appeared in print greatly misrepresents his remarks and attributes to him certain statements which Dr. Best did not make, and also certain of his descriptions appear hopelessly confused.

We realize that a grave injustice has been done Dr. Best and are adopting this means of correcting it.

(Signed) C. M. Bailey, Librarian.

THE END

Which the great Lord Bacon proposed, was the mitigation of human suffering and the multiplying of human enjoyment.

With these ends in view, modern dentistry has developed many painless methods, and these same methods are not confined to the specialties, but are used by all up-to-date practitioners of dentistry.

At the twentieth annual session of the National Dental Association, which will convene in Louisville, Kentucky, July 25, 26, 27, and 28, 1916, you will hear not only papers and symposiums on these subjects, but many clinics demonstrating their value and innumerable exhibits showing the instruments and materials used in getting the desired results.

One section will be given up to the subject of Anesthesia in all its phases.

Louisville will throw open the operating rooms of her magnificent $2,000,000 City Hospital for the demonstration of the various anesthetic agents. You can spend one whole day in investigating these methods. If you are interested in your patient's comfort, you cannot afford to miss this meeting. Remember the date and make your plans now.

"YOU WILL FEEL AT HOME IN LOUISVILLE."

TO THE MEMORY OF ABEL JAMES PROSSER, D. D. S.

The St. Louis Dental Society:

Your committee begs leave to report the following:

Dr. Prosser was born in Saline County, Missouri, in 1851. His early education was obtained in the public schools of Saline County, and later at Central College, Fayette, Mo. After leaving college he studied dentistry with Dr. J. K. Stark, of Kansas City. He entered the Missouri Dental College in 1875, and was graduated from that institution in 1877. Immediately after graduation the doctor located in southeast Missouri, where he practiced for two years, at the end of that time he returned to St. Louis and practiced in this city from 1879 until the time of his death, which took place on November 10, 1915. During the many years Dr. Prosser practiced in the City of St. Louis, he was recognized as one of the leading men of his profession.

He was a former president of the St. Louis Dental Society, and the Missouri State Dental Association, in addition to being a clinical instructor in the Missouri Dental College, and its successor, Washington University Dental College. His wonderful manipulative ability and characteristic kindness of disposition endeared him not only to the members of the profession, but to a large clientele which he served.

In the death of Dr. Prosser, the profession of the state of Missouri and the city of St. Louis has sustained an irreparable loss.

Therefore, be it resolved, that we extend to his bereaved widow and family, the sincerest sympathy of the St. Louis Dental Society, in this time of sad bereavement, recognizing in part the loss they have sustained, and

Be it further resolved, that a copy of this memorial be spread upon the minutes of this Society and copies sent to the *Western Dental Journal* of Kansas City, Mo., and the *Dental Review* of Chicago, Ill., and one to the family of said deceased.

Wm. Conrad
Walter M. Bartlett
John H. Kennerly.

THE P. S. D. FUND.

To the Physicians, Surgeons and Dentists of the United States.

Gentlemen: *We, the undersigned,* having devoted our energies for various lengths of time in helping our colleagues, the surgeons, physicians and dentists of France; realizing, that they are working under terrific stress and strain, under improvised conditions and often with an insufficiency of instruments and material, as attested by the Bulletin of the War Relief Clearing House; and feeling, that many of our colleagues here would gladly contribute a sum of money monthly for the purchase of instruments and materials here or abroad as wisdom and need indicate; propose, that such a brotherly manifestation of solicitude be made, and we call upon our professional brethren throughout this land in sympathy with the cause of Liberty and Justice, so dear to these two Democracies, to pledge themselves to contribute to this fund $2.00 per month for the year 1916, from January 1st, to be paid monthly or in block. This sum to be placed at the disposition of the American Relief Clearing House in Paris, the official bureau of all American charities, and in constant touch with all necessities over there. These sums to be expended in such a way as they may see fit, advised by a representative of the French Academy of Medicine, and a representative of the minister of war, in order that the wisest possible use may be made of the funds thus furnished.

Further, we solicit donations of instruments in first rate condition, and hospital equipment of all kinds; bearing in mind that in the present crisis everything is needed.

May we even ask our colleagues to economize in all wisdom, and not to waste in this land of plenty, but to contribute to the cause that which is saved. Also that they may endeavor to interest their various clients to aid us in our work.

We pledge ourselves to our utmost to see that every contribution arrives where there is need for it and feel that this friendly gesture of one country to another through our professional channel, will be received with a gratitude most touching and bear fruit in the relations between our two countries in the future.

What the architects, artists and sculptors of our country have done for their confreres, who are in the ranks across the ocean, we may well do also. (Signed) Geo. E. Brewer, M. D.; G. W. Crile, M. D.; Harvey Cushing, M. D.; Joseph Flint, M. D.; Walton Martin, M. D.; William H. Potter, D. D. S. Approved by: Wm. M. Polk, M. D., Dean, Cornell Univ. Med. College; John Finney, Professor Surgery, Johns Hopkins Univ.; Thomas P. Hinman, D. D. S., President Nat. Dental Ass'n of Am.; E. C. Kirk, D. D. S., Dean, Dental Dept. Univ. of Penna.; W. S. Thayer, M. D., Professor Clinical Medicine, Johns Hopkins Univ.; H. Holbrook Curtis, M. D., New York; John B. Walker, M. D., New York; H. C. Moffit, M. D., San Francisco; John A. Hartwell, M. D., New York; Hugh Auchincloss, M. D., New York. Executive Committee: C. N. B. Camac, M. D., Chairman; Foster Kennedy, M. D., Wm. H. Ordway, Jr., M. D., Whitney Warren, 16 East 47th Street, New York City, secretaries.

All monies subscribed go to the fund without deduction for administration expenses.

Checks should be made payable to J. P. Morgan & Company for the P. S. D. Fund and addressed to P. S. D. Fund, No. 16 East 47th St., New York City.

All contributions in material should be sent prepaid to P. S. D. Fund, War Relief Clearing House, 133 Charlton Street, New York City.

OBITUARY.

BRYANT KERR, D. D. S.

On Thursday, Feb. 17, Bryant Kerr, the quiet dignified gentleman, the perfect type of the professional man, the honored citizen passed from earth.

Born in Bigfoot, Dalworth County, Wisconsin about sixty-eight years ago, the most of his life was spent in Rockford, Illinois. He was the son of Rev. Dr. Thomas Kerr, who was the founder and for many years pastor of the Christian Union Church.

Dr. Kerr began the study of dentistry in the office of Dr. C. A. Kitchen and was graduated from the Pennsylvania College of Dental Surgery in 1880, taking up practice in Rockford soon after and continuing to the time of his death.

In conducting his dental practice, he happily combined a quiet modesty with an unusual ability as an operator, which inspired the confidence of his patrons, and secured for him a large and satisfactory practice.

He was a member of numerous dental societies and attended their meetings whenever possible, but it is only fair to say that he gave to his local society, the Odontological (afterward merged into the Winnebago County Society), his warmest allegiance.

He often contributed to its programs and especially delighted in its many social features.

He never lost a friend.

The writer knew him intimately for nearly forty years, and knows whereof he speaks.

In his home he was affectionate, unselfish, considerate; the ideal husband.

His wife and the circle of immediate relatives who will miss his strong yet gentle personality in the home, have the heartfelt sympathy of that larger circle of professional brethren and friends, who learned to love him for his warm heart and helpful ministrations.

We shall miss his hearty greetings, his kindly interest and wise counsel.

And so farewell.—M. L. H.

DR. ERNST JOSEPH EISEN:—Born May 12, 1876. Died Feb. 27, 1916.

Dr. Eisen was almost instantly killed in a collision between his automobile and a streetcar, while driving with his family. His wife and three children were all seriously injured, while another relative was killed.

Dr. Eisen was born in Milwaukee, Wis., and received his early education in that city and in Germany. In 1897 he was graduated from the University of Pennsylvania with the degree of D. D. S. and has practiced dentistry in Milwaukee since that time. Always to the fore in every line of dental progress, Dr. Eisen was the author of papers on various subjects. For several years he was editor of the "Wisconsin State Dental Journal." He was one of the pioneers in dental X-ray work, and had built up an organization for the special study of mouth infections in relation to systemic disease.

Dr. Eisen was a member of the Milwaukee County and Wisconsin State Dental Societies, of the National Dental Association, the Chicago Dental Society, the University Club of Milwaukee, and the Phi Gamma Delta Fraternity.—R. M. J.

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DIABETES FROM THE STANDPOINT OF THE DENTIST.*

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Minute study of medico-dental phenomena has, with many thoughtful men in our profession, become a matter of profound interest, and particularly as associated with general bodily disturbances. We have learned of late to lay great importance on scientific achievements along diagnostic and pathological lines, much more so than in the past and I am happy to say that these efforts have in no way diminished our activities in the pursuit of improving technique and mechanical results. To be able to properly appreciate pathogenic changes requires profound insight in medical knowledge generally, and I am glad that our profession in quest of that knowledge is awakening to the necessity of much study and thought along these lines, as is demonstrated by the fact, that study and experimental post graduate classes are springing up sporadically and which I trust will soon become universal.

You will note that in the reading of this paper practically all the authorities referred to are *foreign.* That is not a compliment to our profession here, and I hope that in a few years hence it will not be necessary any more, inasmuch as we have started to develop truly scientific men on this side of the water; but it does show the need of a thorough awakening of our desire to delve into scientific studies so as not to permit of the possibility of others to dispute our laurals and well deserved appelation "The Greatest Dentists in the World are the Americans." This, as a word of timely warning.

In following what I shall have to say hereafter, you will note that the dentist, in many instances, may or should be able to recognize incipient diabetes and by being so observant may render his patient invaluable service at a time when the symptoms have not as yet become sufficiently alarming to invite the physician's attention unless he is informed of the patient's condition, as a result of the dentist's keen observation.

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* Read before the Odontological Society of Chicago.

As you all know, the usual principal diasgnotisc sign of diabetes is found in urine analysis and is due to the fact that the patient has lost either in part or entirely, the ability to utilize or to assimilate carbohydrates. This lack of ability to assimilate these foodstuffs is undoubtedly due to pathogenic changes of the internal secretions, most likely through atrophic glandular changes. That the pancreatic secretions have much to do with diabetes has been shown in the experiments of Mering and those of Minkowsky, who in animal experimentation have shown that these animals when deprived of their pancreas exhibit sugar in their urine, if carbohydrate food is given them; but that these animals do not show this urine change if the pancreas is merely transplanted in such a way that its internal secretions are maintained and thrown into the blood. The ability to assimilate carbohydrates in human beings suffering from diabetes is very changeable. The disturbance may be so slight as to become apparent only when the natural degree of tolerance is exceeded by the intake of more carbohydrate food, or it may be so severe that merely the indulgence in a trace of such sugar containing foods will produce a flooding of the whole organism with grape sugar, which shows itself not only in the urine but also in the blood. The appearance of sugar in the latter is known as Hyperglykemia. This blood change is a valuable adjunct in diagnosis, as incomplete kidney function might at times obliterate the findings in the usual kidney tests, such as I shall mention later on. That diabetes is caused by a change in the internal secretions is manifested by the fact that in all cases we find an atrophy in gland material. Considered from a pathological and anatomical standpoint we find that upon studying various authorities, the great importance which we for years have placed in this regard on the activities of the islands of Langerham, has almost entirely disappeared, but after all it should seem rather unimportant to us, in which set of glands these atrophic changes occur; the fact remains, that as soon as this atrophy takes place and spreads to a sufficient degree to change the chemical constituency of the internal secretions the signs of diabetes become apparent. As to diagnostic symptoms, one of the first alarming signs is the usual falling off in weight, notwithstanding the development and continuance of an abnormally great appetite. At other times it is merely the increase in appetite that warns the patient of something being wrong, particularly in such cases where the appetite develops to a phenomenal degree; again it may be the frequent voiding of large quantities of urine. In other cases patients will first become aware of a feeling of general muscular weakness together with premature impotence. A word of caution with reference to furunculosis and repeated carbuncles is most fitting at this juncture—whenever such conditions present themselves, urine analysis should at once be made, as these are frequently primary expressions of an attack of diabetes. Occasionally a very severe itching of the skin will cause the patient to first apply for medical aid. This, in the female subject, is quite frequently found in unbearable itching in the vulva. Again other patients will notice merely stomach disturbances and mouth and tooth disorders. The bacteriology of the oral cavity (particularly in severe cases) becomes markedly changed by the preponderance of yeast and mould forming bacteria. It is a mooted question to what this bacteriologic change is due. It may be caused by the repeated stomach disturbances, which disorders are still further increased by the fatty diet and over-eating generally, to which these patients have become addicted. Some authorities insist that this prevalence of yeast and mould germs is due to the fact that these germs find (particularly in the later stages of the disease), an excellent habitat in the sugar contents of the oral mucous membrane and in the acid saliva. Personally I have but little faith in this occurrence of these sporulating organisms as being of any diagnostic value whatever and believe that their presence is accounted for in the same manner in which it is found in any of the debilitating diseases, such as pneumonia, typhoid, etc., cases in which these organisms are quite frequently found and in which their presence is entirely insignificant, as far as being of diagnostic value; in fact it is expected more or less on account of the low vitality of the patient. The preponderance of these bacteria may be the cause of the severe stomatitis so frequently a symptom of diabetes. The fact that diabetic patients show a great loss of resistive power to all sorts of infection brings to our mind a most interesting question. Is this loss of resistive power in these diabetics (and possibly in all subjects of low resistance whether diabetic or not) due to a chemical blood change such as occurs in diabetics, as

Hyperglykemia (or in other cases of lower resistive power, to some other chemical blood change) or is it due to the change in the secretions of the internal glands? An oral symptom frequently found in early stages is a very marked feeling of dryness in the mouth, throat and also of the tongue. The etiological cause of such symptoms is easily found, if we will but consider that the large amounts of sugar which are voided require a very great quantity of water to carry it off in solution. A stomatitis and general reddening of the oral mucous membrane is a noteworthy oral manifestation which is to be looked upon with suspicion. That defects in nutrition of various tissues, which is one of the characteristics in a history of diabetes, should affect the oral mucous membrane, by producing inflamed areas, is not astonishing, particularly if we take into consideration the aforementioned lack of moisture, or the likelihood of pressure inflammation caused at times by artificial dental substitutes. When dentures which have been used in comfort for sometime suddenly are brought to us with the complaint of sore places which at first glance appear to be produced by pressure of an artificial piece and which soreness does not disappear after easing the removable substitute, such cases should at once arouse suspicion. The appearance of the tongue should be noted and in diabetic subjects is found to be enlarged with the edges indented and marked by the pressure of the teeth against them. At times the surface of the tongue is found heavily coated, accompanied with these indentations and further is apt to show deep fissures and cracks, which are painful and very intractible to all efforts we may make to cause them to heal. Such occurrences should immediately lead to urine analysis and other examinations. Again we find enlarged and inflamed papillae on the tongue and mildly shining, smooth, blue red, colored blotches, such as are frequently seen in Leukoplakia.

More frequently we find a gingivitis such as Schneider has described as "gingivitis chronica diabetica." The gingivae and particularly the interdental gingival margins show dark red edges, bleed easily and are painful. The whole gum tissue at the same time swollen and tumified. A further development of this tissue change will be noticed either in the necrotic breaking down of the gum margins or their retraction, laying bare large surfaces of the tooth neck and possibly the alveolus. Prof. Grunert also describes whitish patches on the oral mucous membrane, which if irritated by brushing of the teeth will break down into small pustules that are very painful; patients complaining of severe burning pains. This necrotic appearance of the gingival margin is often much like that found in cases of scorbutis. Magitot speaks of this gangrene of the gingivae as a serious symptom of diabetes and he says further, that it usually is sure to be present at some time during the progress of the disease. The close relationship of the gingivae to the peridental membrane is naturally quite apt to produce a periodontitis from close relationship of tissue alone; and, according to Prof. Port, this peridental inflammation is most apt to be found over the bicuspids and incisors of the upper jaw and under the incisors of the lower jaw, without, however, anything being pathologically wrong with the teeth thus involved.

In Germany a species of alveolitis or pyorrhea has been differentiated from true alveolitis and termed "alveolar blennorhea." Whether this blennorhea is really different from true pyorrhea (or better alveolitis) has not been firmly established. In true alveolitis usually only single teeth are attacked or at least only in small groups and preferably in the lower jaw, while this diabetic blennorrhea always affects a number of teeth in a row or whole sections and usually begins on the molars working forward and preferably in the upper jaw. The great change expressed in the entire ceasing or at least great reduction in the pus flow immediately upon improvement in the general health is most striking. A proper change in diet (Schneider) consequently also a change in glandular secretions will cause such a blennorrhea to disappear entirely in the course of a few days. Prof. Port also adds that the peculiar rapid accumulation of soft tartar deposit of light color which is easily removed, is quite different from the conditions found in true alveolitis; he also notes that after removal of this soft deposit there is a very rapid reaccumulation. That true alveolitis is a frequent condition found in diabetics is very obvious and not at all astonishing inasmuch as many cases of alveolitis are due to changes in the tissue, and gland secretions produced by the very same activities which bring on the other diabetic symptoms. What is of greater importance, however, is not the question of what kind of alveolitis is found but to what use a minute understanding of the symptoms may be utilized so as to be of diagnostic value in diabetis.

Although Professors Dolbau, Koener, Albrecht and others admit that the occurrence of the alveolitis or blennorrhea does not of necessity exist in all cases of diabetis, nevertheless, they all insist that whenever pus pockets in a number of teeth, particularly in rows of loose sensitive teeth are found, a urine examination should be made and more particularly so if this condition of (acute) infection has appeared suddenly (Baum, Gille.) Besides the usual co-existence of this alveolitis or blennorrhea, whichever you may choose to call it (until such time as further proper investigation has proven the conditions existing to be one or the other or the same disease expressed differently), there is to be found in these diabetic cases a peculiar result to the formation of these pus pockets, namely the ultimate loosening and final loss of the teeth so affected, the roots of such lost members showing resorptions in the shape of large deep notches and according to Gruenert at times almost needle like pointed root ends, which are as a rule of brownish transparent color almost like "amber." The cause of the ultimate loosening or loss of such teeth is variously described by Van Norden, Henius, Wiessner and others, to be due either to the ultimate destruction of the peridental membrane, or to the destruction of the membrane, sockets, and roots by pathogenic changes in the tissues, caused by the altered conditions of nourishment to these tissues. In controversy to these theories Prof. Scheff states that he has repeatedly seen diabetic patients in whom he found no stomatitic conditions, no blennorrhea and no loosening of teeth although the general conditions of diabetes became worse and worse until death. This loosening of the teeth then may be absent entirely in the history of certain cases but the fact that it does frequently occur in the early stages of the disease shows that it should at least be noted as a warning signal and that is more particularly true if the loosening of the teeth has come on quickly and painfully without any apparent local cause. That such a condition can occur without diabetes but in other serious bodily disease was proven very conclusively in a male patient of mine forty-seven years of age, the soundness of whose teeth had always been a great pleasure for me to comment upon. When this man presented himself one day with a very loose lower lateral incisor, there appeared no reason whatever why this tooth should so suddenly have become so extremely loose. In this case there was no pus, no deposit, no hemorrhagic or stomatitic gingivae. I sent him to his physician who diagnosed his case as "cystitis" and the man died in six months without my having seen him again. His physician informed me, however, that he had lost this tooth and two adjoining ones. The other symptoms such as blennorrhea, stomatitis, hemorrhagic conditions of the gums; sudden loosening of the teeth with the characteristic root absorptions and amber like changes in the color of the root ends, all seem to be due to disturbed tissue metabolism. Teeth loosening in this manner very quickly return to health when the sugar temporarily disappears or becomes greatly diminished. Frequently a sharp toothache and pain will precede the loosening of the teeth which does not occur in alveolitis. The pulps of such teeth are invariably alive and destruction thereof does not lessen the pain nor does the extraction of the teeth give the quick relief such as when teeth are removed in cases of pyorrhea. That the severe inflammatory process of pus formation on whole sections of teeth can easily spread to the alveolar process and maxillae proper, is not at all surprising, if we take into consideration the lack of general resistive power of diabetics. Such cases of necrosis are on record and some which by themselves have been sufficiently extensive to cause the death of a patient (Kirk and Ottolengui.)

Magitot describes minutely a peculiar liability to caries of the teeth in diabetics, which theory, however, is not concurred with by other notable writers such as Scheff and Henius. Personally I have had several such cases, one a particularly striking example was a man of seventy-eight years of age who ultimately died of diabetes and who during the progress of his illness illustrated the peculiar character of caries of the teeth which Magitot describes. These teeth decayed very, very rapidly, beginning with the posterior ones and gradually attacking others situated further forward, the crowns decaying in such a manner that nothing but ragged stumps were left. This particular patient would lose almost an entire crown in a month's time from decay. I found the bottom of such cavities filled with a marked leathery yellow brown decay which could be lifted almost clean from the underlying slightly softened dentin. According to Scheff and Henius this terrible onslaught of a process of caries on many teeth in great rapidity is frequently one of the first symptoms of diabetes. Other important authorities have substantiated this entirely (Von Lube, Epstein, Herschfeld, Landons, Senator and Fronstriumple.) Professors Grunert and Port even describe this condtion of caries to occur in the ring shaped manner which I noticed particularly in the aforedescribed case; it was most marked on the anterior teeth and bicuspids, while the molars decayed rapidly on the buccal surface leaving the overhanging enamel intact like an empty egg shell. This decay would start on the neck of the teeth by exhibiting a peculiar shaped brownish or yellow spot, which could be easily overlooked entirely by a casual observer, but which rapidly progressed to actual decay around the whole circumference of the neck of the tooth, entirely devoid of pain or of any sensitiveness, so thoroughly different from decay of that kind when of a non-diabetic nature. The shape of these cavities in the beginning is a cut as if produced by a saw. The groove rapidly spreading toward the crown end and more slowly towards the root end. The enamel does not seem to join in this process so much and is many times left like a hollow shell, (this refers more to the molars) (Grunert). This process of peculiar decay of the teeth is again not always found in every case of diabetes but when it does present itself, it should be regarded as a noteworthy danger signal. Any sudden carious activities attacking numerous heretofore sound teeth should at once signal the dentist that a urine analysis is in order. The same holds true where suddenly all cement fillings seem to dissolve away rapidly. Various authors have ascribed the acid reaction of the saliva as the causative factor for these various conditions of caries and loss in substance of cement fillings, although other teachers ascribe as the cause of this phenomena the changed nutritional conditions in the tissues comprising the tooth substances (Wiessner).

The question of the etiological reason for the acid saliva in diabetes has by no means been solved as yet, notwithstanding the fact that men like Magitot, Port, Mosler, Mantnner and others have investigated it and written about it considerably. Some believe the acidity to be due to a lack of acid production caused by sugar decomposition, others again deny this theory emphatically, but as this acid condition is recognized as a causative factor for the production of the peculiar caries and by many for the peculiar soft tissue affections (although they may be lacking in some cases entirely) it would surely be of interest if we could be more certain of its etiology. That this acid reaction of the saliva is not due to sugar decomposition seems quite probable, for in many analysis of diabetic saliva no positive sugar reaction was found. Some authors claim the acid reaction of the saliva is due to acetone and acetic acid formation. As I have mentioned before, patients complain of a severe toothache, often of a neuralgic character, even with teeth not affected by the aforementioned blennorrhea, such pain may be caused by a peculiar effect of a condition of diabetes on the dental pulp and may lead to its destruction but in many cases of these violent paroxysms of toothache there appears to be no caries, no complete death of the pulp, nevertheless, the formation of a fistula from the root apex of such teeth have been described by Trauner. I have never seen such fistulæ and am not convinced of the possibility of such occurrences. Periodontitis is another frequent mouth symptom, as are the various tissue disturbances and the occurrence of the blennorrhea or pyorrhea with their peculiar-loosening or loss of teeth and peculiar root absorptions and discolorations, all of these pictures should call your attention to a possible diabetes.

The prognosis of diabetes aside from correct treatment, depends largely on the character of the attack, on the patient's age and on the peculiar complications arising in the case. The more severe the attack and the younger the patient the less favorable will the prognosis be. Most attacks of diabetes during childhood lead to a rapid fatal ending. The milder cses and those which come under proper treatment early, in which all sugar is quickly removed present a favorable prognosis for a longer period of life contrary tc those which are ushered in with attacks of coma such have a most unfavorable prognosis. Cases which in the beginning seem to be favorable ones, however, may quickly develop very serious complications leading to a rapid, untimely end. The serious complications such as coma, furnuncles or carbuncles and other pus symptoms, gangrene (which usually begins on the toes) are considered very bad and point to very unfavorable prognosis. The great danger of lack of nutrition generally is of all things the most menacing feature of the disease at all times.

The diagnosis of diabetes is made from the laboratory examinations of the urine and to a much lesser extent from the blood analysis. The urinanalysis should never be omitted if any of the dental or general symptoms enumerated above have been observed. For the purpose of urinanalysis only a twenty-four hour specimen should be used as it is most important to arrive at a true quantitive analytical result and not at a mere percentage. This is most important; examinations of small specimens with the idea of calculating from them is naturally entirely incorrect, inasmuch as the specimen obtained may have come from a urine voided at a time when practically no carbohydrate food had been taken in. The diet of course is not to be changed before this first analysis is made. Should the symptoms suggest diabetes and the urine analysis result in negative findings, a sugar tolerance test should be made, namely the test known as Glycosuriae Saccharro. After partaking of a hundred grams of grape sugar, the urine is examined; this method is the best and most reliable procedure. The blood analysis for sugar as mentioned before is constantly gaining in favor but has not yet developed to such a simple procedure that every practitioner is able to undertake it ; both apparatus and technique requiring a knowledge and equipment which is usually only found in the pathological laboratories of hospitals. In making these urine examinations, obviously it is important to be certain that the reduction results are due to sugar and to the proper kind of sugar, before making a definite diagnosis. Levulose sugar occasionally is met and when it is, it makes the diagnosis of diabetes very difficult; in its reactions in the usual urine tests it is found to reduce, will respond to fermentation tests and will produce an osazone but in polarization tests will turn to the *left* and more to the left than grape sugar will be found turning the light to the right. Still more difficult will be such cases where both sugars are present, the results of the polarization tests will be almost nil and in that case the Seliwanoff test, that is boiling with resorcin and hydrochloric acid will give positive results, the sediment in such a test would be red if positive. Lactose in polarization will turn the light to the right but will not respond to fermentation tests. It will reduce but will not respond to Trommers test unless it is boiled. It is important to keep this lactose in mind, especially if the patient under consideration be a nursing mother. In case of milk retention, sugar is very apt to be voided in the urine and would not indicate diabetes. The mere color reactions then in ordinary urine examinations, as you see, are far from certain to complete the diagnosis of diabetes, and when found must be further submitted to other tests to arrive at correct conclusions. Transitory Glycosuria can only be differentiated from true diabetes by proper watching and the tests should always be regarded with suspicion as such a case is apt to turn into true diabetes at any time. Drugs play only a minor part in the therapy of diabetes. Practically only morphine is occasionally used, which has been found to prevent the reduction of sugar; so unless surgical means are required to obviate serious lesions, the treatment will almost wholly depend on proper diet. This consists of an allowance of the exact amount of carbohydrate according to the particular tolerance in the individual case, which must be constantly watched and the food changed to suit the case. According to modern theories such diabetics who do not show sufficient improvement after the reduction of the amounts of sugar in the food alone; it has now become common practice to reduce the albuminous food as well, in fact, the whole of the amount of kalories allowed is to be reduced. The Oats cure in Europe has become quite popular; after diminishing the average daily kalories by utilizing the nutritional elements of vegetable alone for several days, the patients are fed exclusively on oatmeal and butter, strange as it may seem this carbohydrate rich food is easily taken care of by diabetics and thus far no explanation has been suggested in what way this is made possible. Not only do these patients stand this diet well but it seems to forestall the production of the dreaded acetone and acetic acid. Cures of this kind should be given in hospitals and sanitariums arranged for that purpose, these patients requiring most careful watching as regards their diet. Of course urine examination during such a constant and simple diet very quickly shows any change in assimilative power; I must add here however that a number of cases reported in which this effort at a cure produced the very opposite results and had to be almost immediately discontinued, the reason for this is equally still unexplained.

The therapy for the various mouth and teeth affections as mentioned before is rather an ungrateful one and further than proper oral hygiene, very little can be done. The treatment of the general ailment being more important to relieve the oral troubles. Amelioration of the local symptoms is about all that can be expected. Mouth washes, astringent applications and the repair of carious teeth, the selection of gutta percha as a filling material are here to be mentioned. I feel that Prof. Grunert is incorrect in his serious warning as to the avoidance of amalgam as a filling material on account of the mercury in it per se, fearing that contact with the gingivae is apt to produce necrotic areas, as I do not believe that this metallic mercury would produce any such irritation. Of course any new stationary bridgework is to be avoided, peridental lesions are too apt to cause an untimely loss of both bridge and abutments. Tartar should be scrupulously kept off the teeth, the pockets of an alveolitis should be washed out frequently with a one-half per cent solution of lysol or peroxide of hydrogen. Iodine mixtures, especially if mixed with chloride of zinc and glycerine are very advantageous, being stimulating, disinfecting and soothing. Balsam of Peru is recommended highly by Port, as a soothing application to ulcerating pockets after they have been washed out. Loose teeth should not be extracted, but should be ligated or banded, as the chance for recuperation is very favorable. However, no matter how much care is used in these local measures unless the general condition is improved but slight benefit is to be expected. Special care is required in watching these cases after extraction for secondary hemorrhages. After pain and difficulty to get the extraction wounds to heal in these people is quite common. Washes containing chloral and two per cent phenol for applications to the sockets on tampons are of value. Extractions and all wounds are to be avoided whenever possible and thorough asepis is a first and last positive requirement.

The peculiar odor of the mouths of these severe cases of diabetics is not caused from the chemical decomposition ordinarily occurring in diabetes alone, but is due to the production of acetone, which is a most serious factor in the disease and the condition produced is known as Acetonuria or incorrectly Acetonemia. This acetone is thrown out merely in the exhalations and evaporations from the skin and only slightly by the kidneys, so that the occurrence of this peculiar mouth odor (a sickening sweet odor as of fresh fruit) should arouse serious suspicions in the dentist. The acetone can be quickly recognized in the urine by the Gerhard reaction, namely the Burgundy red color obtained by adding chlorid or iron to urine. The reaction thus obtained does not depend on the acetone but on the most important by-product namely acetic acid and beta oxybutyric acid. The Koma Diabeticum is produced by the interference of this oxybutyric acid with the proper chemical decomposition which should go on in the body, and also by the actual poisonous effects of oxybutyric acid (and its salts), such coma only precedes death by a few hours.

PREVENTIVE DENTISTRY.*

BY RUSSELL W. BUNTING, D. D. SC., ANN ARBOR, MICHIGAN.

Preventive dentistry and preventive medicine are very closely allied. The progress of preventive medicine in the past few years has been rapid. Discoveries have come in quick succession whereby radical changes have been made in our knowledge of the subject and iron-clad ideas have given place to newer conceptions. One of the chief results of these investigations has been the accentuation of the importance of infection. Many general diseases which were formerly thought to be due to a variety of causes have been traced back to infection as a primal causative factor. The recent work of Billings, Rosenow, Hartzell and many others has proven without doubt that there is a direct relation between certain localized infections and lesions of the heart, articulatory joints, gall-bladder, appendix, etc. Indeed there seem to be but few diseased conditions which cannot be traced either directly or indirectly to infection.

Preventive medicine of today is seeking to determine the ways and means by which the bacteria or their products gain entrance to the body to produce their untoward effects, and to devise methods by which such invasion may be prevented. The present view of the situation is that the great majority of these infections are localized about the mouth, and either they or their poisons find access to the human economy very largely by three definite avenues.

One, by way of the tonsilar crypts.

Second, by way of abscesses which exist in the alveolar process at the apex of the root of a tooth.

Third, by way of spaces and pockets about the teeth produced by peridental inflammation.

Among these important portals of entry by which infection may reach the circulation, two are to be found in the mouth. Because, then, of the proven significance of such mouth conditions and their sinister effect upon the whole economy, preventive medicine, which is to be effective, must include preventive dentistry. In the practice then of preventive medicine and dentistry, we must seek to close these two avenues of infection which lie within the mouth and to devise methods by which these locations shall be made permanently imprevious to the invasion of organisms.

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*Read before the Chicago Dental Society, February, 16, 1916.

In the first of these two mouth conditions, we find that dental abscesses are very largely the result of infection introduced into the tissues through the death of pulps of teeth, or by filling procedures which are intended to replace that organ. The prevent such occurrences we have sought in every way to perfect our technic of root-canal filling to the end that root canal infection of apical tissue cannot occur. But, at its best, the filling of root-canals has proven to be a difficult and hazardous operation. There is, in fact, but one safe and compatible root-canal filling and that is a live and healthy pulp. Could we but keep the pulps of all teeth alive and in health, this avenue of infection, in most cases, would be forever sealed.

But the maintenance of a live pulp in a tooth, necessitates that it be protected from the untoward influences which irritate it and induce its inflammation and death. Of the sources of these harmful irritations, by far the largest is caries of the teeth. Could we but prevent dental caries, the great majority of tooth pulps would remain in health and vital activity throughout the life of the individual. In the prevention of entrance of infection to the body through the avenue of periapical abscess, we should seek by all means to prevent the primal cause of these conditions, the greatest of which is dental caries.

In the second avenue of infection we find bacteria and their toxins gaining entrance to the blood stream through the diseased tissues about the necks of the teeth. Normally, and in health, the mucous membrane of the mouth is resistant to infection and bacteria do not find an easy entrance to the deeper tissues beneath. The most vulnerable area of this membrane is to be found in those portions which exist as holes through which the teeth have protruded. Normally, these tissues have a firm attachment to the peridental membrane and hug tightly about the teeth, but in disease this attachment and adaptation is destroyed, disease producing bacteria grow freely and find a ready access to the peridental lymph and blood spaces, whereby they may become a menace to the whole body. In the prevention of entrance of infection to the body through these tissues we should seek by all means to keep the mucous membrane at the gingiva of the teeth in good health ad normal protective power.

Thus we see that could we but thoroughly and effectively prevent these two dental diseases we would render a valuable assistance to the practice of preventive medicine in that we would thereby close two important avenues by which localized bacteria may produce serious harm to the bodily economy. It is, then, the purpose of this paper to review, with you, our present knowledge of the prevention of these two dental diseases. We shall attempt in such a presentation to classify the various causes of these two conditions according to the classification of causes of general disease. In all of which we are fully aware of the multiplicity of factors which may enter into the problem in each case, but we shall endeavor to state only those which are most prominent, which occur most frequently and about which we have the most definite information.

In his classification of general diseases, Adami distinguishes two general groups of causes, namely, exciting and predisposing. Of these, the exciting causes are the proximate or active agents which actually produce the change in normality which result in a specific pathological condition. An example of this class of causes may be found in the infectious diseases in which the exciting cause is the specific bacteria which produce their characteristic disease. But such bacteria are not always able to produce disease. They are everywhere in nature and the human body is constantly brought in contact with them. Certain infections have a high degree of virulence which enables them to gain entrance to the tissues and produce disease whenever they come in contact with them. But the great majority of infections have not that power unless they are preceded or assisted by that other class of conditions which prepare the tissues of the body for the entrance of the bacteria and permit their characteristic action within the economy. The predisposing causes therefore are in many cases, the determining factors which inaugurate the various disease processes. Pneumococcus is the frequent inhabitant of the mouth and throat but in health the body is not affected by it. Cold, fatigue, or an attack of influenza may lower the resistance of the body and create conditions favorable for the onset of pneumonia. So also pneumonia in turn may become the predisposing cause of tuberculosis of which the acid fast bacillus is the exciting organism.

In applying this method of analysis to dental caries, we find that there is no one specific bacteria which may be spoken of as the exciting cause, but rather it is one or more of a large class of bacteria which are able to form acid when acting upon carbohydrates. Such organisms when localized, produce organic acids capable of decalcifying tooth structure which process is characteristic of dental caries. But by virtue of the fact that caries-producing bacteria are present in all mouths and that in many the disease does not occur, it may be seen that the action of the exciting causes is dependent upon certain other predisposing factors which are necessary to caries production. This being true, the variable factors which determine the occurrence of caries is not to be found in the exciting causes, alone, but rather in those factors which are predisposing to their action.

We, then, are confronted with a long list of predisposing conditions which exist in the various cases in an almost endless number of combinations. Pickerill has estimated that there are 3,628,000 such combinations, which is to say that of this number of caries, no two might have exactly the same group of causes. We have then in our study of the cause of caries, ceased to hope for the discovery of any one, all predominating factor, which in all cases, by its presence or absence, will determine the inception of the caries process. We rather consider caries to be determined by the balance of power of several predisposing factors, which in their combinations in one case swing the tendency toward immunity, and in the other toward susceptibility. So that the study of that subject is directed oward the determination of the relative importance and *modus operandi* of some of these factors in the effort to establish methods of increasing those conditions which tend to swing the balance toward immunity.

Of all the predisposing causes which may be concerned in dental caries, the following arbitrary grouping of the most prominent of these may be made:

1. The resistance of the tooth.
2. The localization and protection of the exciting organisms, and the concentration of the acids which they produce upon the tooth.
3. The amount of carbohydrates available for fermentation.
4. The lack of neutralizing properties in the saliva.

The importance of enamel surfaces as a predisposing factor is not determined. Clinically, many are convinced that certain enamels are soft and more easily broken down, and that such teeth are more prone to caries for that reason. But, in view of the fact that the hardest and most perfect enamel may quickly succumb to the action of the acids of caries, while many teeth which are evidently of poor formation may suffer little from caries, the resistance of the enamel, per se, does not appear to be of major importance.

A more direct relation may be seen in those predisposing causes which enable the exciting organism of caries to act in a concerted manner, which confine the acids which these bacteria produce against the enamel surface, and which protect such acids from neutralization by the saliva. In this class of predisposing causes, we must include, the sulci of the teeth, all imperfections of tooth-form, overhanging fillings, crowns, etc., which mechanically may protect a growth center of caries exciting organisms. Also there are all those irregularities of the teeth which make them difficult to cleanse, the amount of salivary mucus which has the tendency to stick foreign material to the teeth, the methods and habits of mastication, the personal care of the mouth by the individual, and all those conditions which are included under oral hygiene in its broadest sense. Any one, or a group of these above named conditions, may establish favorable places for the growth of the bacteria of caries, where they may multiply, produce their characteristic acids and decalcify the teeth, without which predisposing factors the exciting causes of that disease could not be effective.

But these bacteria which are capable of producing caries cannot be operative unless there be a sufficient amount of carbohydrate for their consumption in acid fermentation. So that an abundance of carbohydrates in the form of sugars is a predisposing factor to caries production. The amount of such carbohydrate is determined by the diet and all those factors named above which control the hygiene of the mouth, they simultaneously localize and protect the bacteria and offer means of lodgment for carbohydrates in their vicinity. These two classes of factors work hand in hand to augment caries.

In our consideration of these factors there still remains one other class of influences which may have a greater importance than any which thus far have been mentioned. Cases frequently are seen in which, seemingly, all the foregoing predisposing causes are present, in which oral hygiene is imperfect and yet caries does not occur. In such cases it is possible that certain properties of the saliva may have the power to neutralize or render inert the acids which have been produced by fermentation. There is in most salivas a variable amount of alkaline principles, which if conditions allow, will unite with the acids of caries and prevent them from decalcifying the tooth. An absence, or small amount of these antacid principles in the saliva would be a factor of predisposition by which the acids of caries might become operative.

In addition to the alkaline elements, many salivas possess an abundance of heavy mucus. Thus mucus may gather upon the teeth with great rapidity and form a veritable covering or coat for them. Certain of these mucinous deposits plainly are seen to be protective in that they absorb the acids and keep them from the enamel, and when broken down by bacterial action they form alkaline end-products. Little is known of the nature, source, or action of these beneficial mucins but it is very evident that in certain cases they have a very important part in the prevention of caries. On the other hand it frequently occurs that the oral mucins have a high acid content and do not protect the tooth but predisposes toward enamel destruction.

In the study of methods and means whereby dental caries might be prevented, an attempt has been made to remove the exciting causes of that disease by decreasing all mouth infection. It was soon found that if germicidal agents were used continuously, the tissues of the mouth were also injured and degenerations were produced while the mouth flora quickly regenerated after such spasmodic attenuation. The most practical method of decreasing oral infection is to be found in the use of washes and prophylactic measures which mechanically remove a large number of bacteria and decrease the food upon which they live. A thorough application of these principles will very materially decrease the number of mouth organisms.

As regards the control of the vast array of predisposing factors, which enter into the process of caries, less definite information is at hand and much still remains to be determined. A great deal of serious thought and endeavor is being given to the investigation of these factors in search of methods by which the predisposing causes may be decreased, and secondarily, the action of the exciting causes made less probable.

Of all the research which has been reported, only one suggestion of a practical preventive importance at the present time has any general acceptance, namely the use of fruits and fruit acids as described by Pickerill, Gies, and others. It has been asserted by these men that acid foods and mouth washes produce a reaction on the part of the salivary glands which causes them to pour out a secretion which is thinner in consistency and more alkaline in reaction. This reaction is noted directly after the use of such foods and continues for a short time after. Also that a continued use of such acid diet will result in a permanent thinning of the saliva and an increase of its alkaline constituents. Considerable attention has been given to this phase of treatment and some degree of corrobatory evidence of a clinical nature has been obtained.

The plan, briefly stated, consists of the eating of fruits of a decidedly acid nature at the end of every meal and at night before retiring. Mouth washes of dilute vinegar or cream of tartar are used in the mouth toilet. In our hands, this treatment has resulted in a decided improvement of oral conditions in certain cases. The saliva has become thinner, the teeth more self cleansing, and the alkalinity of the mouth is raised, all of which should have a direct effect in reducing the causes which predispose to caries. But in other instances, marked digestive disturbances are set up and the teeth take on an extreme sensitiveness. More clinical data should be obtained on this method in order that its real value may be determined.

In the work which Mr. U. G. Rickert and the writer have done in the University of Michigan during the past two years under the auspices of the Research Commission of the National Dental Association, several phases of the problem of caries prevention have been attacked. Of these, there are two which seem to give the most promise of returns, namely, the condition of the enamel surfaces and the calcium content of the saliva.

In the investigation of the enamel surfaces we have subjected a large number of teeth to silver nitrate and after precipitation of the silver have sectioned them. By this method we have found that a large percentage of teeth are porous on their outer surfaces. This porosity usually consists of small tube-like openings which enter the enamel but a short distance, or in very poorly formed teeth, the permeability extends entirely through the enamel to the dento-enamel junction. Specially is this seen in the cervical portion of the teeth when the hygiene has been poor and microbic plaques have persisted which frequently produce a complete permeation of the cervical enamel. It is seen that teeth of a high degree of organization, the strong highly glazed variety, are usually almost imprevious to the silver salts. Also that teeth of an inferior quality, when worn by abrasion, present an enamel surface at the point of attrition which is dense and lacking in porosity. When the surface of the ordinary forms of enamel is reduced by grinding or polishing until the porous exterior has been removed, the surface then obtained is usually dense and admits little penetration by liquids. Several teeth which had been under prophylactic treatment for some time, were examined in this manner. They had highly polished and opascent surfaces which were impervious to the silver nitrate. It did not appear that the enamel surfaces had been reduced materially but the action of continued polishing seemed to be similar to that of abrasion, producing a solid and dense surface.

All of this led us to enquire into the possibility of treating the enamel of the teeth in such a manner they would become condensed and less pervious to the fluids of the mouth and the products of bacteria. Such, dense and polished surfaces obviously would be more self cleansing, and would offer less ready attachment for microbic plaques, mucin, etc., which would be an important factor in the limitation of dental caries. The methods by which this condensation may take place are not clear but it is possible that under certain circumstances the calcium salts from the saliva may precipitate into the openings in the enamel and fill them. Pickerill says that the enamel of all teeth is extremely porous when they are first erupted, but that on contact with the saliva, their surfaces become more dense, which change the attributes to precipitation of salts from the saliva into the imperfections of the enamel surface. If this be true, and there seems to be evidence that it may be, the enamel of all teeth is condensed on its outer surface by virtue of some action of the saliva, and we may reason, *a priori,* that the variations in condensation of the enamels of various teeth is dependent to a large extent upon the nature and chemical composition of the saliva. That is, that one saliva may produce hard and dense surfaces upon the teeth which they bathe while another saliva will lack the properties which are necessary for that action, and the enamel of the teeth will remain in the porous condition in which they were erupted.

In pursuance of this problem we have looked into the amount of calcium which is available in the various salivas for this process of condensation. We find that the salivas of various individuals differ in the amount of calcium which they contain, and that in each case the calcium content is fairly constant from day to day. It is also noted that a relatively high calcium finding in the saliva is usually associated with teeth which are hard and firm in texture and even in color, while in case the calcium is low the teeth are frequently whitish in appearance and do not possess good surfaces. The results which have thus far been obtained in this study are not conclusive enough to warrant making any definite statements, but the indications have led us to devote a considerable amount of time in the attempt to correlate the calcium content of the saliva with the condition of the enamel surfaces and the occurrence of caries. Of all the various principles of the saliva which we have thus far studied, none of them in our hands, have shown as marked a relationship to caries susceptibility as does the calcium findings. If it be true that a high calcium content of the saliva serves to consolidate the enamel surfaces and if by its alkaline properties it may neutralize the products of carious fermentation, the increase of that salt in the saliva should act as an efficient aid in caries prevention. In this connection we have attempted by various ways to increase the amount of calcium in the saliva by artificial means, such as feeding, stimulation, etc., and experiments are now under way at the present time which are directed toward that end.

In all of this work but one feature has thus far been established as being of practical importance, and that is the beneficial change which is induced in enamel surfaces by mechanical rubbing or polishing. The enamel of teeth which are rubbed either by abrasion of one tooth upon another, or by the judicious polishing and cleansing which has been continued over a considerable length of time undergoes a surface condensation. This may be noted in the change in the external appearance of such enamel surfaces and in the decrease of permeability to silver nitrate.

In a consideration of the practical methods of prevention of dental caries which are available at the present time we find that those measures which are employed in the production and maintenance of oral hygiene offer much that is of value. Stated in the broadest terms they may be said to be an attempt to make the mouth more self-cleansing and more easily cared for by the personal effort of the patient. The effect of such treatment would be the reduction of the amount of food debris retained about the teeth and a disturbance of the localized centres of fermentation, both of which are important predisposing factors in dental caries. So that such prophylactic measures, looking toward the highest state of oral hygiene, theoretically should prevent dental caries. The question arises, does it do so clinically? Regarding this there is a difference of opinion. Many claim that prophylactic treatment in any form, does not prevent caries, and they are very positive in their assertions as borne out by their own clinical experience. While of those who are practicing oral prophylaxis most intensically, and are giving a large portion of their time and attention to such practice, invariably they assert that, in their experience, although oral prophylaxis does not prevent every individual case of tooth-decay, it materially decreases the occurrence and in a large number of cases renders the mouth immune to that disease.

In our study of the effectiveness of oral prophylaxis we have become convinced that the results to be obtained are dependent very largely, upon the thoroughness with which these measures are carried out by the operator. The ordinary cleansing of the teeth has but little effect and is of doubtful value in caries prevention. When upon examination we find that in the great majority of teeth the enamel surfaces are rough, we can realize how quickly new deposits of foodstuffs and bacteria will reattach themselves to those surfaces, and what difficulty is offered to their removal by the action of brush and dentifrices. When on the other hand, the teeth are polished until they are smooth on all of their surfaces, they mechanically retain far less extraneous matter and they are more readily cleansed by any friction which may be applied to them. In addition to this, the practice of adapting all crowns and fillings so that they are absolutely flush with the tooth surfaces, and contouring them so that they are in close contact with their neighbors, and in normal occlusion with their antagonists, markedly decreases the amount of food retained about the teeth. But, no matter how thoroughly the work of cleansing and polishing tooth surfaces be done, the factor of supreme importance is that of the care which is subsequently given those teeth by the patient. Spasmodic cleansing has but little effect and the continued maintenance of mouth hygiene can only be accomplished by proper instruction of and co-operation by the patient.

In such cases then in which the highest state of oral hygiene is obtained and maintained, the exciting cause of dental caries will be diminished, the predisposing factors which cause the microorganisms to become localized and which furnish the food material for fermentation will be greatly inhibited, and the balance of caries producing forces may by virtue of this condition be thrown over to the side of immunity. But if this process is but incompletely carried out and retention centers are left undisturbed, or if uncontrollable factors are present which are of extreme virulence, the balance, in spite of all prophylactic measures may be swung toward susceptibility and dental caries ensue. In caries prevention then, oral prophylaxis may be incomplete and leave much to be desired. Still, at the present state of our knowledge, these measures, when carried out in their most thorough manner, offer the greatest aid to caries prevention which are known. We fully believe that the developments of the studies of the subject which are now being made, will shed further light upon the problem and will suggest other and perhaps more effective methods which will either enlarge or supplant those measures which we now know and employ.

In the consideration of that other group of diseases which affect the tissues about the tooth, we may distinguish three distinct phases of disturbances. The simplest of these is gingivitis, in which the gingival tissues undergo functional and circulatory changes; second, a more advanced stage of disturbance, known as interstitial gingivitis, in which the deeper tissues, the pericementum and bone become involved, and third those conditions in which the deeper lesions become inhabited by pyogenic bacteria and pus is produced, namely suppurative pericementitis or pyorrhea alveolaris. These three conditions are a chain of links in which one follows the other in the order named and such is the order by which the great majority of peridental diseases run their course. It is true that a certain number of cases are seen in which the process of peridental tissue destruction is more nearly related to atropy and degeneration than to inflammatory conditions, but these in our opinion are extremely rare as compared with the other more commonly occurring forms, and which will not be considered at this time.

Let us consider the typical case which is so frequently met with in its various stages of progress. Begin, if you will, with the normal conditions in which the gum festoons hug tightly up against the tooth on all sides. The color of the tissues is an even pink, being slightly lighter than the color of the blood. In such conditions the epithelium of the mucous membrane continues over the gingival crest down into the gingival space and unites with the pericementum at its attachment in the bottom of that space about the tooth. In such conditions the tissues are completely covered on all exposed surfaces with a healthy epithelium which is resistant to the action of bacteria. As a rule, the first departure from normality is noted in the change in gum color and the loss of tonicity of the gingival tissues which results in their falling away from the tooth. The color of these tissues turns to a deeper red denoting active hyperemia, later changing to blue and purple when the gum circulation is in the state of passive or congestive hyperemia. If the process continues, inflammation results and the health and attachment of the peridental tissues is impaired. Progressively, the inflammatory process is communicated to the deeper tissues with the destruction of a portion of the pericemental membrane and a wasting of the bone which forms the alveolus. When pus producing bacteria are present, a liquefaction of these tissues is effected and true pyorrhea has been accomplished. The course of this process as outlined will be determined by the nature and severity of the causative factors and by the vital activity and resistance of the tissues involved.

And what are the causative factors of pyorrhea? This is a question which recently has excited much discussion and has been the subject of volumes of literature. The opinions which have been given have been of such diverse nature and many of them have been so wide of the truth that a considerable confusion has arisen in the minds of many regarding the exact nature of the process under consideration. Indeed, these peridental affections are complicated in that they have many phases and manifestations, but the most commonly occurring varieties are the result of certain definite conditions which may be classified after the manner of general diseases.

The exciting cause of the first class of diseases known as gingivitis in a great majority of cases, is some form of local irritation. The irritation may be from mechanical source, such as tartar, impaction of food, overhanging fillings, etc., by chemical means, such as irritating acids, drugs or nicotine, or by the biochemical products of bacteria. Any one, or a group of these causes, by their irritating effects, may excite an abnormal circulation in the gingival tissues. The predisposing cause of such conditions are the untoward factors of faulty oral hygiene which allow these irritative materials to remain in contact with the gingival tissues until they had produced their characteristic effects.

In the second class of peridental diseases in which the deeper tissues have become involved, we can usually distinguish the chief exciting cause to be some form of micro-organism which has gained entrance to the gingival space from the mouth cavity. Among these are to be found the various forms of streptococcus, staphlococcus, pneumococcus, spirilla, fusiform bacillus, entamoeba, etc. These various organisms find in the damaged subgingival tissues a splendid field for growth and multiplication, where they may produce their characteristic action. The virulence of their attack is determined by the particular strain or strains of organisms which happen to be in predominance in each individual case. When they are of the pus-producing type they liquify the tissues and produce the third type of disease, suppurative pericementitis.

The predisposing causes of the two more severe types of disease are to be found in the gingivitis which inaugurated the process, without which few of these deep-seated and advanced stages of peridental disease would exist. Cases frequently occur in which the exciting cause of the initial gingivitis is bacteria growing in transparent plaques at the cervical portion of teeth. These same bacteria, by such preparation of the gingival tissues may find entrance to the deeper structures and be the exciting cause of the more severe type of disease. In such cases tartar and other forms of local irritation may be entirely lacking.

The question may be raised as to the part which is played by the internal exciting causes, such as insoluble products which may float in the blood stream and lodge in the capillaries of the peridental tissues, where by their irritation they may produce inflammatory conditions. An example of such internal irritants may be found in the insoluble salts of mercury which are the frequent cause of mercurial stomatitis. It has been found in many hospitals where large amounts of mercury are given in the treatment of syphilis, that if the teeth are kept thoroughly clean and free from all deposits, that large quantities of mercury may be given without any gingivitis being produced. From which it may be deduced that local irritation produces circulatory changes in the gums which predispose that tissue to the lodgment of mercuric salts, but in case the circulation is normal, those irritating materials in the blood pass through the capillaries unimpeded. It may also be reasonably inferred that the same conditions obtain in case of other drugs and auto-intoxications which may be present in the blood stream.

Substantiation of this view may be seen in the fact that in those cases in which internal intoxications, such as gout, uremia, etc., are closely associated with the manifestations of peridental disease, that when these cases are put under treatment and the progress of the disease is arrested, they usually may be permanently controlled by the simple maintenance of strict oral hygiene. In which case, again, the removal of local irritation and the restoration of the gingival circulation to normal, markedly prevents the further lodgement of circulatory irritants.

A very common chain of predisposing causes of peridental disease may be seen to consist of the accumulation of foreign materials and fermentative processes upon the teeth at their gingival border, inducing gingivitis. This in turn prepares the deeper tissue for invasion by pathogenic and pyogenic organisms from the oral cavity which produce the destruction of those parts. So that in the so-called pyorrhetic conditions, as well as in dental caries, the important factors of inception are not to be found in the exciting causes, which are always at hand, in health as well as disease, but the determining principle rather is to be found in those conditions which predispose the tissues to the action of the destructive and exciting agents. In the case of peridental disease these predisposing causes are very largely found to be some form of irritation. Mechanical, chemical, and bacterial irritations are to be found existing as primal causes in the great majority of cases without which the destruction of tissue by whatever the form of micro-organism would not have taken place. It is true that such peridental inflammation is also dependent upon and may be induced by departures from a state of health of the whole body which may alter the circulation and lower the normal resistance of those tissues, but of all the cases which are presented for clinical study, those which are produced by the local irritative factors by far overbalance those which are of a general or system source. Evidence of this is seen in the marked improvement which is obtained in practically all cases when the mouth is placed in the state of strict hygiene.

Prevention, then, of such conditions should consist of the perfection of methods of procedure by which these various local irritating materials might be continuously kept from the vicinity of the gingival tissues and the resistance of all mucous surfaces raised to the highest degree. This again involves the obtainence and maintenance of the highest form of oral hygiene. Polishing and shaping of the teeth, and artificial substitutes so that they may be self-cleansing and offer the least possible retention to food debris, tends to diminish the irritation by food impaction and enables the patient by proper training and co-operation to keep the teeth relatively free from all irritative materials. In addition to this, the patient in the personal care of his teeth, if a stiff brush be properly used high up on the gums, will stimulate the circulation to the gingiva, and will by friction excite the formation of a thicker and tougher epithelium which will be more resistant to injuries than is the average. In this manner he simulates the harsh scrubbing of coarse and tough foods which the lower animals consume, and which so largely have disappeared from our diet. Clinical evidence has shown that mouths so cared for seldom suffer from gingivitis the first stage of the process. It is also clinically evident that, in all those cases in which gingivitis has set in, the surgical removal of all tartar and elimination of centers of food accumulation, the polishing of the teeth and the proper care by the patient usually results in a return of the tissue to a permanent normality.

It is further seen that the most successful operators upon peridental diseases, today, are confining their treatment to simple measures of absolute oral cleanliness. They do not enquire as to the exact nature of the specific organisms involved but direct their energies solely to rendering the entire crown and diseased root surfaces as smooth and self-cleansing as possible. With such surgical treatment alone, they, in a great majority of cases, induce the peridental tissues to return to a healthy state and are able to maintain them as such as long as the practice of oral hygienic principles be continued. May it not therefore be reasoned, that in such cases had these same oral hygienic principles been employed previous to the inception of peridental disease that it would not have occurred?

But in order that these prophylactic measures which have been referred to be a benefit to the dental tissues, all such operations must be carefully and judiciously carried out. Excessive and unwarranted grinding of the enamel will produce sensitiveness to the teeth and great discomfort to the patient. So also, extensive and vigorous instrumentation of tooth surfaces beneath the normal gingiva will injure the attachment of the peridental tissues to the root and will destroy the very relations which we seek to conserve. It is to be deplored that many operators with seemingly good intentions, are sacrificing a considerable portion of enamel substance and are destroying the close proximal contacts in their effort to make teeth self-cleansing. Such practice is wholly unwarranted, unnecessary and dangerous. The object to be obtained is a polished enamel surface and this may be attained in most instances by the removal of but an infinitesimal thickness of enamel substance. This may be compared to the polishing of a gold crown, in which an effort is made to obtain a smooth surface with a minimum loss of gold thickness, and the smooth surface so obtained is subsequently given a high polish. So also the enamel surfaces beneath the gingiva and in the interproximal surfaces may be smoothed and polished by careful instrumentation and safe and sane methods of technic, but in all cases the greatest care must be exercised to prevent the injury or destruction of soft tissues which are in the state of normality or near normality at the time. Such operations must then be safely and sanely performed but to be effective they must be so thoroughly carried out that all irritations be completely removed. Such simple. conservative and thorough measures, in the great majority of cases, will maintain the normal tissues in health and will produce a decided improvement in those which are suffering from peridental disease.

In conclusion we may say that in the practice of preventive dentistry as applied to caries and peridental disease the most practical measures of procedure lie in the production and maintenance of oral hygiene. If we would prevent caries, we must keep the teeth free from the localization of bacterial growth and accumulations of food materials. If we would prevent peridental diseases we must prevent all local irritations to the gum tissues. We should make it an invariable practice to examine tooth surfaces and read the gum colors in all cases which come under our supervision. We should consider the slightest change from the normal pink color of the gingiva as a signal of danger, and should bend every energy in the effort to remove the irritation of whatever nature it may be, and continue such prophylactic measures until the peridental tissues have returned to their normal color and tone. We should endeavor to perfect our technic of oral prophylaxis beyond the point of simply cleaning teeth, but rather strive to produce tooth surfaces which are mechanically smooth and polished, in a condition in which they may be kept relatively clean. We then should direct the efforts of our patients by frequent and personal supervision and insist that each surface of every tooth be properly cleansed at least once daily. And in all our consideration of these diseases we must not overlook the intimate relation of the health of the whole body to the health of the mouth tissues, and by suitable corrective and prophylactic measures of a general nature seek to bring the health of the whole body to its highest state of perfection whereby we will most effectively render it immune to disease.

THE COMPLETE TECHNIC INVOLVED IN THE THREE CLASSES OF PULP CANAL OPERATIONS.*

BY ELMER S. BEST, D. D. S., MINNEAPOLIS, MINN.

While your essayist will endeavor to direct your attention and interest to the great problem of pulp canal operations let no one take this to imply that he is an advocate of the creating of pulpless teeth by the removal of vital pulps, so called "devitalization of teeth." A pulpless tooth can never be made quite as good as one with a sound healthy pulp and in addition to this let us understand distinctly that in such operations we assume a responsibility that is not to be lightly considered. Why then do we remove the tooth pulp? In a question between the loss of a pulp and the loss of a tooth it seems to me that if we are prepared to, we should remove the pulp and save the tooth. I say, "save the tooth" because I believe that in spite of the thousands of cases showing the most damaging evidence to the contrary that we are going to emerge from our present predicament with an operation that will give us a pulpless tooth that can be carried through adult life without being the seat of infection. Our greatest problem today is with the tooth which has been pulpless for some time. We all know that there will be fewer pulpless teeth in the future than in the past, for a large percentage of such teeth were rendered pulpless because the presence of the pulp caused discomfort to the patient when the dentist undertook certain restorations on the crown of the tooth. At present, conditions are different and we have several means of robbing such operations of their pain. Some of these are very beneficial, but in one of them there is also a grave element of danger. One of these methods, viz., general anesthesia such as nitrous oxid, etc., appears particularly dangerous and we will discuss it briefly. One of the causes of pulpal hyperemia is the overheating of the tooth. Many times an otherwise extremely painful operation of cavity preparation is made quite bearable by the application of a stream of water or a fine jet of cold air as suggested by Dr. Reeves, thereby keeping the tooth at a safe temperature. Generally speaking, in the use of general anesthetics it is not possible to observe any of these precautions, except possibly in the hands of a few expert operators. The chief idea seems to be to work as rapidly as possible and prepare if necessary a great many cavities while the patient is under the influence of the anesthetic. I have come rather frequently in contact with three conditions due to the use of this agent. Too extensive cutting has caused an exposure of the pulp. Too rapid cutting also causes an overheating of the tooth or sometimes several teeth, thus hypermia is set up. Lastly a rather amusing condition. Owing to the inability of the patient to feel pain and to the hurry in which the cavities were prepared, I have observed crowns and inlays placed on non-vital teeth with large infected periapical areas in the assumption that they were vital teeth.

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*Read before the St. Louis Dental Society, March 7, 1916.

I will not attempt tonight to dwell on the effect which infected teeth have on the patient's system. This fact has been satisfactorily established and is, I find, generally accepted. I shall, however, try to show you what I consider to be the principal causes leading to such conditions of the teeth, and also what I consider a rational method of preventing such conditions. To your essayist one of the principal causes of our recent predicament is the fact that although our degree assures us of the fact that we are Doctors of Dental Surgery (notice the Surgery, please), yet we seem to have had no more conception of the real significance of asepsis than if the word was the name of a recently launched U. S. battleship. Possibly you consider this statement too strong, so I will modify it and say that we are the real offenders who have been guilty of the following habits: First, not using the rubber dam. Second, wrapping unsterilized cotton from open cotton holders on smooth broaches, and placing them in the pulp canals. Third, sealing canals with cotton or porous cements. I do not think it is necessary to go further.

I want to go on record as saying that the habit of opening into the vital dental pulp without a working knowledge of aseptic precautions and strict application of the same, is a crime against humanity and the tragic part of it is that it is the innocent who suffer.

The profession may be broadly divided into two classes—those who practice dentistry merely for the sake of the money in it, and secondly those who in addition to the pecuniary rewards are really trying to improve dentistry as well as themselves. To the first class belongs the advertising dentist. It is useless to try to interest such a man in the advancement of the profession—and the hope of the dentist is in the last named class.

Another interesting observation is that some men do poorer operations after they leave college than they did before, for the same reason that many men in this world are so constructed that they only do their best under the surveillance or guidance of those whose duty it is to see that their work measures up to a certain standard. Left to themselves, however, their work is always below standard. How many of us belong to this class? Let me answer it with another question. How many of us whenever one of our operations, be it inlay, crown, bridge or plate, is unexpectedly to be viewed by one of our confreres, hasten to assure him that there is something wrong but for such and such a reason we were not able to do a good operation?

How much more liable are we to see the hidden operations slighted. You all noted what Hunter said, and more recently what Schamberg said about good bridgework being so rare that it is a luxury for a wealthy patient to possess it. Ottolengui realized the situation when he took the "Green Bus" among the Philistines and said "your state board license *permits* you to practice dentistry, it does not *compel* you to." Rhein knew it when he said in speaking of pulp canal operations, "Gentlemen, you have dragged this operation in the gutter for so many years that you are ashamed of it, you despise it," and Raper was looking into the near future when he said "the time is rapidly coming when the layman will seek as his dentist the man who will look after his health, and not the one who wants to decorate him." And all the time Callahan, Prinz, Ottolengui, Rhein, Buckley, Hartzell, Kells, and others have been anxious and willing to show us the way to success. These men have all sacrificed themselves to help dentistry, but we must need wait until Mayo, Billings, Rosenow and others of our medical confreres caution us as to our position. Ulrich with his strict hemotogenous theory has given us a jolt, and when he demands a good showing of well filled canals with no periapical necrosis, there seemed to be so few in existence as to be almost a rarity. A personal examination of 3,000 cases shows less than 10 per cent of the pulpless teeth with the canals filled and over 70 per cent of the unfilled showing periapical necrosis.

It might appear from the above that you have selected as your essayist a pessimist of the deepest dye, but, gentlemen, this is not so. If I did not believe that these conditions could be and would be, yes, are already being changed, I would not be with you today, nor would I continue the practice of my profession. We can do good pulp surgery, the great question is how many will "hit the trail."

What I shall try to give you tonight is the result of over three years' constant study on this subject. But I want to caution you that the methods which I may advocate are so rapidly being changed and improved upon, that by tomorrow some of them may be obsolete.

We have three great classes of pulp canal operations:

First. Those on teeth which contain former and imperfect pulp canal operations.

Second. Those on teeth containing vital pulps.

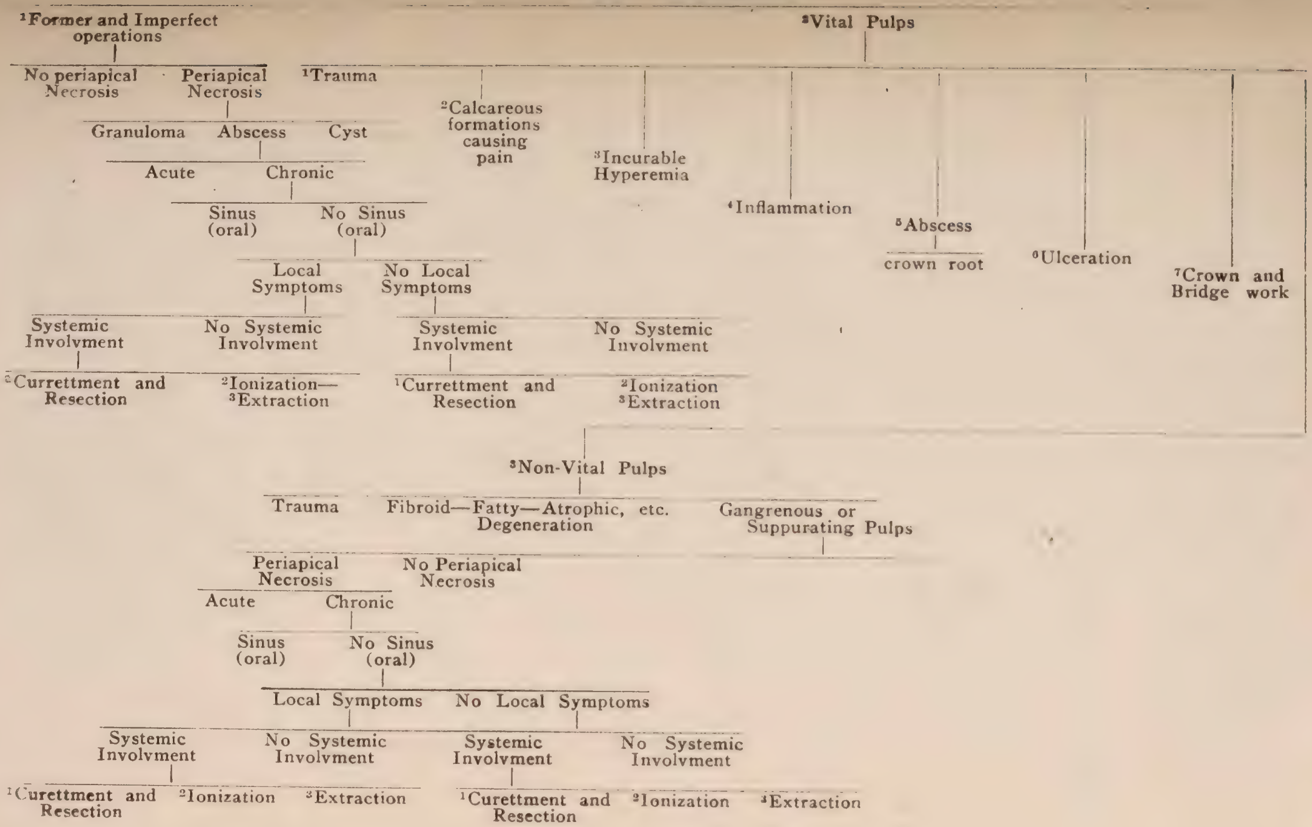
Third. Those on teeth containing non-vital pulps.

In doing operations on teeth in classes as one and three and occasionally on multi-rooted teeth, in class two, we have found it the best practice to consider the indications for conservative and for radical operations.

By conservative operations we assume that our duty is performed when we have, under aseptic conditions, removed the organic tissue, cleansed the canals, sealed the foramina, and filled the canals.

By radical operation we mean the complete filling of the canal, and in addition the removal of necrotic periapical tissue and some-

PULP CANAL OPERATIONS.



times root resection, because of the death of the peridental membrane around the root tip. Resection is also indicated on some occasions because of our inability to remove the organic tissue from and fill the apical portion of very crooked roots.

CHART II.

FORMER AND IMPERFECT OPERATIONS WITH NO PERIAPICAL NECROSIS.

CONSERVATIVE OPERATION.

1. X-Ray examination.
2. Isolate tooth.
3. Xylol—Rhein pics. Reamers to remove filling material.
4. XXX fine bristle (Pathfinder) (H_2So_4 Paste), Reamers.
5. XXX fine file.
6. XX fine file.
7. XXX fine short barbed broach, H_2So_4, 30% Sol.
8. XX fine short barbed broach, H_2So_4, 30% Sol.
9. XXX fine ordinary barbed broach, H_2So_4, 30% Sol.
10. XXX fine Apex curettes.
11. XX fine Apex curettes.
12. Measurement wire—X-Ray.
13. Oil of cloves.
14. Ionize.
15. Fill canals. Gutta Percha.
    Chloroform, ℥iii.
    Rosin, gr. xii.
16. Seal canals.
17. X-Ray.

CHART II—B.

FORMER AND IMPERFECT OPERATIONS WITH PERIAPICAL NECROSIS.

RADICAL OPERATIONS.

Explained on Chart.

CHART III.

NON-VITAL PULP—NON-INFECTIVE.

1. X-Ray examination.
2. Isolate tooth.
3. Remove tissue in pulp chamber.
4. Remove tissue in large canal with sterile barb broaches.
5. In fine canals (Pathfinder), H_2So_4, 30%.

6. XXX fine file.
7. XX fine file.
8. XXX short barbed broach, H_2So_4, 30%.
9. XX short barbed broach, H_2So_4, 30%.
10. XXX fine ordinary barbed broach, H_2So_4, 30%.
11. XXX fine Apex curette.
12. XX fine Apex curette.
13. Measurement wires.
14. Oil of cloves.

Gutta Percha.
15. Fill canals. Chloroform, ʒiii.
Rosin, gr. xii.

16. Seal canals.
17. X-Ray.

CHART IV.

NON-VITAL PULP.

GANGRENOUS OR SUPPURATING PULP.

1. X-Ray examination.
2. Isolate tooth.
3. Remove contents of pulp chamber.

(a) Seal Formo Cresol
4. (b) Sodium Potassium
(c) H_2So_4 Paste

} Immediate Operation.

5. Oil of cloves dressing.
6. Pathfinder.
7. XXX fine file.
8. XX fine file.
9. XXX short barbed broach.
10. XX short barbed broach.
11. XXX fine ordinary barbed broach.
12. XXX fine Apex curettes.
13. XX fine Apex curettes.
14. Ionize.
15. Measurement wires.

Gutta Percha.
16. Fill canals. Chloroform, ʒiii.
Rosin, gr. xii.

17. Seal canals.
18. X-Ray.

CHART V.

VITAL PULP.

1. X-Ray examination.
2. Local anesthesia.
3. Isolate tooth.
4. Remove coronal portion.
3. Large canals, barbed broach.
6. Fine canals (Pathfinder), H_2So_4, 30% Sol.
7. XXX files.
8. XX files.
9. XXX short barbed broach, H_2So_4, 30% Sol.
10. XX short barbed broach, H_2So_4, 30% Sol.
11. XXX fine ordinary barbed broach, H_2So_4, 30% Sol.
12. XXX fine Apex curettes.
13. XXX fine Apex curettes.
14. Measurement wires.
15. Oil of cloves.

Gutta Percha.
16. Fill canals. Chloroform, ʒiii.
Rosin, gr. xii.

17. Seal canals.
18. X-Ray.

CHART VI.

PROBABLE CAUSES OF PERIAPICAL INFECTION.

1. Use of arsenic.
2. Not using rubber dam.
3. Sealing dressings with cotton or porous cements.
4. Not removing all decay from the cavity.
5. Not cleansing the field of operation.
6. Use of unclean chip blowers in pulp canals.
7. Use of non-sterile cotton from exposed cotton holders.
8. Wrapping cotton on smooth broaches with unclean hands immediately before placing in the canal.
9. Not using clean instruments sterilized immediately before using.
10. Sealing in as dressings, irritating and tissue-destroying drugs.
11. Leaving in the canals non-vital pulp tissue.
13. Not removing all the moisture from the canals.

14. Not filling canals to apex.
15. Use of medicated canal pastes which destroy periapical tissue.
16. Not sealing canals upon completion of filling.
17. Paying little or no attention to asepsis.

CHART VII.

HOW TO AVOID PERIAPICAL INFECTION.

1. Use of anesthetics (local).
2. Use of rubber dam.
3. Sealing dressings with combination of cement and gutta percha.
4. Thorough removal of all decay from cavity.
5. Liberal application of iodin and alcohol to field of operation.
6. Use of filtered compressed air.
7. Use of sterile cotton.
8. Use of sterile dressing bristles and canal points.
9. Sterilization of all instruments immediately before using.
10. Use of non-irritating drugs as dressings.
11. Thorough removal of all organic tissues in canals.
12. Careful Roentgen examination of the tooth, including measurement wires.
13. Proper guidance and care in handling instruments and drugs in canals.
12. Having canals dry to apex before filling.
15. Sealing foramina and filling canals with inert, insoluble, non-irritating substance.
16. Sealing canals flush with floor of pulp chamber with oxychlorid of zinc cement.
17. Maintenance of asepsis during the operation.

EMBOUCHURE.

BY DR. T. S. CHILDS, SAN DIEGO, CAL.

What is it? How does it interest the dentist? An embouchure is that peculiar formation and delicate sense of touch developed in the muscles of the musician that plays either a brass or reed instrument. The performer that plays a brass instrument places the mouthpiece against the upper and lower lips with the lips resting against the labial surface of the anterior teeth, then with just a slight pressure on the mouthpiece and certain contractions of the muscles of the lip aided by those of the cheek, the tongue, and air from the lungs, the tone is produced. The amount of pressure used is not so great that constant practice or playing would produce a callousness, but a strength and firmness in the muscle that quickly respond to the impulse of the musician, and the embouchure is that development of the lips between the pressure of the mouthpiece from the front and the resistance of the teeth from the back that allows the musician to produce the perfect tone.

Tone is reckoned at so many vibrations per second; for instance, international pitch A, from which all other tones are governed, has 435 vibrations per second. The higher the tone the more rapid the vibrations, the lower the tone the less rapid. The valves on the brass instruments and the keys on the reed, of course, very materially assist in making the different tones, but the rate of vibrations on which the *quality* and *purity* of tone depends must absolutely be made by the muscles of the lips aided by those of the cheek, and to understand and realize the importance of the embouchure you must know that the musician in playing from a lower to a higher register, or from a higher to a lower, must change his lips to produce a different rate of vibration for each tone.

The reed performer develops his embouchure very much along the same lines, with the exception that instead, he places his upper and lower lips over the incisal or cutting edge of the anterior teeth as the mouthpiece of the reed instrument is placed in the mouth between the teeth instead of against the teeth as with the brass instrument. The lower lip is pressed against the reed and regulates the pressure to produce the different vibrations, and make the perfect tone.

All musicians begin to play early in life, many while yet children, and rarely one begins after 21 years of age, and the hours of practice and playing develops that formation and delicate sense of touch that allows them to make certain tones without being conscious of the muscular contraction of the lips or the efforts required to make them. As the blind person who reads by rapidly passing his fingers over the raised letters is not conscious of what his fingers feel, but has his mind on the subject he is reading, just so with the musician that plays brass or reed instruments is not conscious of the efforts required to make certain tones, but has in mind the melody he is to produce.

How does this interest the dentist? In just this way: in making restorations for patients of that class it is absolutely necessary to preserve the original length, form, and position of the original teeth, as the embouchure is formed between the pressure of the mouthpiece from the front and the resistance of the teeth from the back, the teeth being just as important as the mouthpiece and to change the form or shape of the teeth would have the same effect as to change the shape, or form of the mouthpiece, and that is something musicians will not do, if they do change, the new mouthpiece is so near like the old one, that one not familiar with them could not detect the difference, and just here is the point for the dentist, in making restoration for musicians if with a crown or bridge for the anterior teeth they should reproduce the original teeth as near as is possible to do so in order to preserve the efficiency of the embouchure.

Musicians as a rule do not understand that the teeth, as you might say, form the opposite side of the embouchure from the mouthpiece. They value the mouthpiece more than gold on account of the shape or form they have been accustomed to using, and then if they go to a dentist that does not understand the importance of an embouchure they wonder why they cannot play, when their irregular teeth are replaced by a bridge made even and straight.

Can you imagine what would happen to the playing of Padereweski, the noted pianist, or Kreisler, the violinist, if one or two of their fingers should happen to be made a little longer, or a little shorter? Would they ever play as well again? Yet changing the length or form of the teeth of musicians that play brass or reed instruments would have the same effect on their playing.

According to Owen Miller, secretary of the American Federation of Musicians, there are about 35,000 musicians in the United States making their living playing brass or reed instruments and as only a small per cent of that number would need restoration of a nature that would effect the embouchure, so all of us have not had the opportunity to study and observe the effect of such restorations, but if this short article will help you to understand and realize the importance of the embouchure, then it is up to your skill as a dentist to preserve its efficiency by reproducing the original teeth as near as possible.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held Wednesday evening, December 8, 1915, the president, Dr. P. J. Kester, in the chair. Dr. H. H. Schuhmann read a paper on "Diabetes from the Standpoint of the Dentist."

DISCUSSION.

Dr. M. L. Goodkind:

It is a great privilege to be with you this evening and to enjoy the opportunity of listening to so able a paper as has been presented by the essayist. I did not have an opportunity to read his paper in advance of its presentation and I am amazed at the wide scope covered, so that I can add but little in the way of new information. The thing I should like to emphasize, however, is the desirability of closer co-operation between the dental and medical professions. I personally regard the dental profession a special department of medicine, as is the oculist or the orthopedist.

Concerning the signs of diabetes which may first be detected from the condition of the oral cavity and its contents there may be a peculiar type of *fetor oris,* the mucosa of the mouth may be atrophied, the saliva may contain lactic acid and give an acid reaction, there may be recession of the gums without explainable cause, the tongue may be dry, broad, reddened and fissured, small ulcerations resembling aphthae without the usual ptyalism, a condition resembling thrush and due to the oidium albicans is sometimes present. Ulceration of the tongue and gums which bleed readily and presence of xerostomia are suggestive of diabetes. One of the earliest signs to attract attention to a possibility of this disease is a dental neuralgia without any apparent diseased condition of the teeth. This symptom sometimes is also suggestive of certain forms of Bright's disease. We may have an early and painless caries which is especially characteristic, or the teeth may abscess without the presence of caries. Loosening of the teeth due to absorption of the alveolar processes, recession of the gums without pyorrhea may all be found in this disease. Any one of these symptoms alone or in combination, especially when associated with gradual and insidious loss of flesh (notwithstanding increased appetite), unquenchable thirst, increase in the frequency and in the amount of urine passed, a dry and injected conjunctiva, an early formation of cataract, skin manifestations, especially boils and carbuncles, loss of knee jerk, nerve pains resembling tabes, are all indicators of a pre-existing diabetes, and a confirmation that this condition exists should be sought for in a most careful analysis of the urine. It is not sufficient to examine a single specimen, but a total 24-hour urine should be used. In certain individuals in whom we suspect a diabetic tendency the urine may not yield positive results and it may be necessary to estimate a sugar tolerance. This can be done by the administration of 100 grams of cane sugar.

Regarding the examination of the blood of a suspected case, this method is feasible only in hospitals, equipped with laboratory facilities, and where the intake of carbohydrates can be accurately measured.

Regarding the methods of treatment which we at present employ, none, in my opinion, compares to the Allen starvation procedure. Formerly one hesitated to starve one's diabetic patients for fear of producing an acidosis. From our own experience, which is in accord with that of others who are making use of this method, not only is there no danger in the production of an acidosis, but on the contrary, a pre-existing acetone and diacetic acid reaction of the urine, together with an increase of the ammonia output (which I regard as a very excellent indicator of an acidosis) generally disappears under this procedure.

Dr. C. N. Johnson:

I would like to ask Dr. Goodkind how long a time is required for the elimination of the sugar in the average case by means of the starvation treatment; and also what in his opinion is the cause of an accumulation of tartar in gouty disorders?

Dr. Goodkind:

It is impossible to state the length of time necessary for the complete elimination of the sugar under the starvation treatment as each case is a law unto itself. Some patients respond in two or three days while in others a week's abstinence may be required to achieve our results. Loosened teeth frequently become firm under this treatment and many symptoms referable to the mouth quickly disappear with the disappearance of the sugar. It is necessary to have the patient in the hospital in order to successfully carry out this form of treatment.

Concerning the causes of the accumulation of tartar in gouty and lithemic individuals I have no data on this subject, but I assume it to be due to the disturbed metabolism in these patients which permits of an increased bacterial and putrefactive change and possibly an augmentation of the calcium metabolism.

DR. SIDNEY KNOWLES:

The dental profession will be stimulated to more scientific work by just such papers as the one read by Dr. Schuhmann tonight. I am reminded as a result of this paper of cases in my own practice in which I have not heretofore appreciated the presence of diabetes. The presence of sugar may possibly be a contributing cause of pyorrhea through the mechanical irritations of the gingivae as described in the paper. The mechanical irritation caused by the presence of a sliver in a finger may be relieved by hot fomentations, etc., but this treatment will not take the place of the removal of the sliver. Analogous to this is the presence of sugar in the body abnormally.

I recall the case of a man, 55 years of age, who had to that time suffered from no dental trouble except a little erosion. In a period of six months, however, *very marked* caries occurred. Such a patient in my opinion should be examined for diabetes, as I believe the connection may be quite direct.

Fermentation we know is one of the great causes of the breaking down of teeth as a result of the by-products resulting from the action of the fermentation. Whenever there is a change in the normal mouth secretions, as in diabetes it often permits of an enlarged opportunity for fermentation.

Erosion may also be one of the results of diabetes. This possibility should be more thoroughly studied and investigated.

DR. C. N. JOHNSON:

Many constitutional diseases may be detected in their incipiency by the dentist. Such cases should be referred by the dentist to the medical practitioner. I recall the case some six years ago of a patient with obscure changes in the appearance of the mouth, and particularly the increased rapidity of the formation of salivary calculi. This patient was referred to the family physician for diagnosis, and the report of the physician was that there was nothing wrong. This patient, however, died within six months, when he should not have died. I am positive that if this patient had been thoroughly examined and the trouble located his life might have been saved. My experience in this case somewhat discouraged me from referring such cases to medical practitioners. I shall hereafter examine more carefully and intelligently for constitutional conditions as shown by dental and oral symptoms.

I am pleased to note that the sentiment of community and fraternity between physicians and dentists is growing rapidly.

Dr. L. L. Davis:

The meeting together of both the medical and the dental professions aids in illuminating some of these obscure subjects. The cause of diabetes is a somewhat mooted one even among the members of the medical profession, whether due to the presence of lactic acid, preventing the splitting up of the dextrose, or to the failure of the liver to take up all the sugar entering the system, or to a kidney condition with adrenalin as a factor. We know that diabetes is quite prevalent. I have referred two incipient cases of diabetes within the last six weeks, one of which was that of a man with a sudden breaking down of previously good teeth. As Dr. Evans recently said, "Why don't you dentists quit talking about pyorrhea and the loss of teeth, etc.? The medical man today does not talk about pulmonary cavities, but about the earlier symptoms of tuberculosis." The dentist of today should dwell upon the incipient rather than the late stages of pyorrhea and other oral conditions.

Dr. J. E. Hinkins:

I have co-operated with and been associated with the medical profession closely for thirty years, and we have constantly conferred together about our cases. I regard such co-operation and consultation as very essential. We have got to have more science and less mechanics in our profession. The former will be increasingly successful and the latter will be gradually less so.

Dr. E. A. Royce:

Unfortunately for humanity, many years ago the medical profession turned down attempts to make dentistry a specialty of medicine. The time is not far distant when it will be necessary for the dentist to attain more medical knowledge than the medical man has dental knowledge at the present time. I was led to associate the presence of systemic conditions with local mouth conditions through an instance of a patient who developed apparently a periodontitis occasioned by small amalgam fillings in almost perfect molar teeth. These fillings were removed and the particular tooth was lost. A lateral incisor with gold fillings was next attacked and lost, and so on until eight teeth were lost. The patient died within four weeks.

Another instance came under my observation wherein the application of oil of cloves in a tooth cavity absolutely relieved pain in the foot, and a further instance where the removal of a needle from another portion of the body relieved pain in the tooth. These cases have been fruitful subjects upon which to base a study of the interrelation between dental and constitutional conditions.

Dr. F. E. Roach:

Such a paper as this of Dr. Schuhmann's is an indication of that broader view which tends to bring the medical and dental professions more closely together. Such discussions as that of Dr. Goodkind are of much value to our profession. The successful dentist of today must be a mechanic, but he must be able to recognize the various lesions presented. As a purely mechanical man, I have been greatly benefited by this paper and discussion.

I wish to refer to the case of a patient with previously sound teeth and with no indications of pyorrhea, who suffered from a loosening of the teeth. The case was referred to the family physician, and was diagnosed as diabetes, which cleared up under treatment. This illustrates the necessity of recognizing these constitutional conditions.

Dr. J. E. Reid:

We derive great benefit from the special and extensive reading and study of those who present papers at these meetings, and we receive valuable information from our visitors from the medical profession.

I am not sufficiently familiar with the subject of diabetes to discuss it intelligently. This paper and the discussion which we have had will stimulate me to observe more carefully along this line.

Dr. J. H. Woolley: Dr. Johnson spoke of a patient who had been troubled with frequent accumulations of tartar. I have such a patient, whom I referred to a physician; the latter did not suggest the underlying cause of the difficulty. I would like to ask Dr. Goodkind what may have been the cause of this rapid accumulation of tartar.

Dr. J. E. Reid:

In the elimination of the lime products coincident with the calculi appearing in the mouth and the calculi which may appear in the urine—are they anywhere near similar?

Dr. Goodkind:

The lime salts in the urine remain pretty near normal in their percentage of elimination, but changes are found in rickets and in osteomalacia. We find changes indicating disturbed metabolism, but we do not find it deficient or increased in the oxylate of calcium. There is no incidence or coincidence. We do not find an increase in the lime salts. We often find quantities of crystals in the urine, urate of soda and oxylate of calcium. The urine is of high specific gravity, from 1022 to 1034, but there is no sugar reaction.

Dr. H. H. Schuhmann (closing the discussion):

I want to thank you gentlemen for the many complimentary remarks which I feel, however, are not merited. I also want to express my appreciation to Dr. Goodkind for the very complete and painstaking manner in which he discussed the paper. I was glad to have him draw your attention to many more diagnostic symptoms of various bodily disturbances. The difficulties encountered at times to correctly differentiate between cause and effect among these various symptoms was very ably elucidated by him. I am glad that he issued a further warning to those who undertake the interpretation of urine analysis and that he insisted that proper knowledge and understanding of such chemical physiology must first be acquired. What he told us of trophal neurosis I am sure was most interesting to all of us and was certainly a valuable addition to the paper. The assurance of a growing relationship of the mother profession with our specialty was very gratifying and flatteringly expressed and I am very happy that our efforts in the direction of study and acquirement of scientific foundation knowledge is appreciated by the medical profession in such a whole-hearted way and any closer affiliation of the two professions will redound to the benefit of mankind.

The remarks of Dr. Hinkins were very flattering indeed. With reference to his belief that the dental profession would soon split into two classes, one of mechanics and another composed of scientific professional men, I want to say that I hope that the change which is surely coming will not result in a *splitting* process but that the dental profession as a whole will come into its own and that all practitioners will become more scientific in their work, but unless there is a thorough awakening to the needs of scientific study and research, then surely the progressive students of things needed will proceed alone far in advance of the main body. The road to all sicentific advance is filled with rebuffs and stumbling stones, but spare only the thorn on the rose and if you are fond of the aroma, go after the rose and do not mind the thorns.

CHICAGO DENTAL SOCIETY.

A regular meeting was held Wednesday, February 16, 1916, with Dr. F. B. Moorehead, president, in the chair.

Dr. Russell Bunting of the University of Michigan, Dental Department, read a paper on "Preventive Dentistry."

DISCUSSION.

Dr. Arthur D. Black:

Dr. Bunting has told us a very interesting story of the work he has been doing and of his own ideas regarding that work. This is the first paper which has been heard before our society for some time, in which it has not been advised that we extract a lot of teeth. (Applause.) He has presented to us a general picture of the pathology of certain portions of the dental field. We should have these two general pictures before us; in the one case of the lesion which begins as dental caries, with the sequelae which follow, the hyperemic pulp, the inflamed pulp, the dead pulp, the alveolar abscess, possibly necrosis, and the systemic conditions. Whenever a case presents any one link in this chain we ought to have in mind all the other links in both directions. So in the other picture which he has presented of the diseases of the investing tissues of the teeth we should have in mind the gingivitis, the gradual involvement and progress of the disease of the peridental membrane, and the systemic effects which may result. In viewing this latter picture, the dental profession has for years failed to grasp the whole of the picture. Our treatment has indicated our failure to grasp it. Whenever we see a case in which there is a pus pocket alongside the root of a tooth, we should have in mind the possible effect of that upon the system, and also the chain of conditions which necessarily preceded. We should always remember that there must have been a preceding gingivitis. If we can get that one picture in pathology clearly in mind, we will practice preventive dentistry more than we have heretofore.

If I were to endeavor to criticize this paper, I would make but one special criticism, and that is that to my mind it is a little too idealistic in its presentation of oral prophylaxis or the socalled oral prophylaxis treatment. One might get the impression from the whole of this presentation, notwithstanding the very sharp and definite statements in the last of the paper, that we can prevent all dental ills by grinding and polishing the enamel of the teeth.

With that one criticism I wish to take up in the same very fine spirit in which Dr. Bunting has made this presentation, some discussion of certain phases of the paper. Dr. Bunting has placed before us in a general way almost the whole picture of the pathology of dentistry with its treatment; therefore a complete discussion will be out of the question. It will be more interesting for me to present some few phases of pathology and treatment.

I wish to add one suggestion to the pathologic picture presented, and that is that to our general view of these two groups, we should add the thought that the first group, beginning with dental caries, is most serious during the period of childhood, and as age advances susceptibility diminishes. The other group, which begins with gingivitis, occurs oftenest in the mouths of adults, and becomes more serious with increasing age. In the application of prophylactic or preventive treatment, the one group which is to be contended with mostly during the period of childhood, and the other in adult life. This separation is important for us to have in mind. We should generally expect to obtain more favorable results by preventive treatment for caries in adult life, because the average person is more nearly immune.

To the picture of the pathology of the investing tissues, we should add the thought of the very slow progress of disease which begins as a gingivitis. Here is a disease which progresses slowly in all of its phases. It is not unusual for five, ten or even twenty years to elapse from the original gingivitis to the final loss of the tooth. It is therfore necessary to co-relate the clinical symptoms of many cases during various stages of progress to get the complete picture. Failure to do this has prevented many from gaining a clear understanding which is necessary to the rational application of treatment.

I wish to refer to the structure of enamel in reference to caries. We should divide the pathological conditions of the enamel into two distinct groups; first, the dystrophies of the enamel; second the acquired defects. Dystrophies should include those conditions in which there has been an improper formation of enamel, which necessarily occurs before the tooth erupts. In this group belong what we have called atrophy and the Germans call hypoplasia, neither one being a desirable term. We have so many other conditions of under-development of the teeth, that these terms cannot properly apply to one of a group. This might be better called a *contemporaneous accretional deformity,* one which occurs at the same time, for all of the teeth which are being formed, occurring along the lines of accretion to the teeth. This represents a condition of illness or malnutrition at a certain period of the life of the individual, and is expressed in every portion of the enamel and dentine of the teeth which were being formed during that illness. In the dystrophy group must also be placed that peculiar condition of *mottled teeth* which is seen about Colorado Springs and many other regions in the West and Southwest, in which there is a failure of development of the cementing substance between the enamel rods, accompanied with much mottling of the teeth. *White spots* in the enamel, in which there is no cementing substance between the rods when the teeth are formed, represents a similar failure of proper development. These are classed as dystrophies or mal-formations or imperfect forms occurring previous to eruption.

Over against these we should put the second group of acquired defects in the enamel, which have occurred after eruption. Caries, erosion and abrasion are the three most important. Pickerill and many other men who have presented the thought that the condition of the enamel is a material factor in the beginning and progress of caries have not sufficiently separated these groups of enamel conditions. Dr. Bunting calls attention to certain penerations of the enamel which he thought were defects in the enamel structure, but which he stated later had occurred because there had been plaques on the surface, which had dissolved the cementing substance, apparently confusing the dystrophic and acquired defects.

We have before us carefully reported observations which show that those teeth which erupt with marked dystrophies do not decay any oftener than the more perfectly formed teeth. Eighty-five per cent of the children raised about Colorado Springs have enamel in which there is little or no cement substance between the rods in the outer one-fourth of the enamel, and yet they do not decay more rapidly than the teeth of persons which are more perfectly formed. This statement applies to every type of dystrophic enamel.

I have never seen among microscopic specimens of teeth with decayed areas, one in which the shape of the area of the decay indicated that the decay beginning on the smooth surface of a tooth, had originated because of the defective structure of the tooth. If the acid had first penetrated a defect in the enamel, then the further progress of the decay would involve the structure of the tooth the same as would decay in a defective pit in the occlusal surface; there would be a penetration in the pit, and a spreading out, involving more of the enamel at the dento-enamel junction than of the surface. I have never seen a specimen showing a decay beginning from such a defect.

The gelatinoid plaque is likely to be found to be the crux of the situation. The gelatinoid plaque today links together the known pathology and the unknown pathology of caries. The gelatinoid plaque which we must consider in this connection is not anything which happens to be on the surface of a tooth, but it is a plaque which must be of such structure that it will act as a dialyzing membrane, a plaque which will cover over the micro-organisms which are held between it and the surface of the tooth, and will not only prevent the acid formed by those organisms from becoming mixed with saliva, but will also prevent the saliva from becoming mixed with that acid, which means that the acidity or alkalinity of the saliva has nothing whatever to do with the penetration of the enamel by the acid in the process known as dental caries. I am not saying that that is so, but if the plaque is such as it has been said to be by men who have made a careful investigation of it, then the acidity or alkalinity of the saliva has nothing to do with dental caries *per se.* I am not saying that the alkalinity or the acidity of the saliva or other conditions of the saliva may not have something to do with the formation or the dissolution of the plaque. I doubt if it is the alkalinity or the acidity, but expect that there is something else in the saliva about which we do not know very much, which controls the situation.

I wish to read a paragraph from the proceedings of the Illinois State Dental Society for 1874, from a discussion upon the presentation of this very subject of the alkalinity and acidity of the saliva in relation to dental caries by Dr. George H. Cushing. The particular statement was made by Dr. G. V. Black in his discussion of that presentation: "The idea that acids, taken as food, produce alkalinity of the secretions of the mouth is not a new one. Liebig and other German chemists report that they produce neutral and alkaline secretions. By changing fruits, pungents and acids, the secretion can be kept normal."* I present this as a matter of interest in connection with the more recent presentation of the same thought by Pickerill.

We have been told that we need more calcium content in the saliva in order to plug up the deficiencies in the surface of the tooth, in order to prevent caries; we have also been told that we ought to have less calcium content in the saliva in order to prevent the ravages caused by deposits of salivary and serumal calculi, all of which goes to show that in the use of fruit acids to neutralize saliva there is a certain law of compensation to which we must pay attention, that we generally cannot do one thing with advantage without having something of disadvantage result.

I would recommend to this society an interesting paper read by Dr. Charles E. Jones in 1911, before the Illinois State Dental Society, on the formation of gelatinoid plaques†. It is well worth reading.

I should like to add a word regarding the relation of gingivitis to suppurations of the peridental membrane. I wish to emphasize Dr. Bunting's statement that we have the pus-forming organisms always present in the mouth, that they do not generally involve the tissues of the mouth, as long as the tissues are healthy, and that it only takes a little irritation of those tissues to afford the organisms a field for operation. This we should take home with us more than any other thing, because of the fact that practically all of those little inflammations of the gingivae can be easily cured. We certainly have not appreciated the importance of them in relation to the serious suppurations that follow.

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* Proceedings Illinois State Dental Society, 1874, p. 57.

† Some conclusions growing out of a study of the cause of dental caries. Proceedings Illinois State Dental Society, 1911, p. 252. DENTAL REVIEW, Vol. 25, 1911, p. 1167.

Prophylaxis and hygiene, should be separated in our minds. Hygiene may be defined as those measures which may be taken to preserve and maintain bodily health, and we may define prophylaxis as those measures which should be taken to prevent a particular disease, and usually in a particular individual. There is quite a difference between those two meanings. Hygiene is the procedure which should be followed by every individual in order to keep himself healthy. Oral hygiene is that which should be done by each individual to keep his mouth healthy. Oral prophylaxis should be employed when there is an indication for its employment. It is not right for the profession to undertake to apply what has been called the oral prophylaxis treatment to every individual regardless of conditions in that individual's mouth. (Applause.) Wherever we grind anything off of a tooth, wherever we polish a tooth, there ought to be some definite indication as to why that thing should be done. Caries is most active in children; diseases of the gingivae and peridental membrane in adults, so that what we apply in prophylaxis for children should be almost entirely in the fight against caries. Caries does not begin under the margins of the gingivae, and no one is justified in polishing under the gingivae of the teeth of a child, unless there is some unusual deposit there which calls for that polishing. Neither is one justified in grinding anything off the surface of the enamel of any tooth, no matter how little, unless there is an indication as for so doing. Pickerill has shown some illustrations of the imbrication lines on the enamel. I think these have given a wrong impression. They can be seen under the microscope, but the surface is not so rough that it has any real bearing on the question of beginnings of caries. If you examine sections of enamel under the microscope these surface irregularities are not a prominent feature, and I think microscopical examination is much more accurate than the odontograph which Pickerill illustrates.

We ought to do judiciously all the things which Dr. Bunting has told us to do, and we must understand the minute pathology of all the conditions, which should be our basis for treatment. We ought to apply prophylaxis for certain conditions of caries. It seems to me to be foolish to apply prophylaxis in pit and fissure defects. If there is a defect in the enamel I would rather put in a simple filling and have that tooth finished for perhaps the rest of the life of the individual than to scrub it once a month for fifty or sixty years. (Laughter.)

For gingival third decays, why should we apply oral prophylaxis once a month when any patient who is sufficiently interested to scrub those places with a tooth brush once a day will prevent decay from occurring? That job ought to be put up to the patient. If a patient is not sufficiently interested to do this, then I do not think we can prevent decay by monthly polishing. The most important thing in this prophylactic treatment is one of the things which Dr. Bunting strongly emphasized, and that is that it gives you a better chance to gain the co-operation of the patient in the management of your case. If you are unable to get such a grasp on the patient that you can secure his co-operation in what you undertake to do, I do not think you will succeed no matter what you are attempting.

For preventive dentistry we have to bring together the three things which Dr. Bunting mentioned, the co-operation of the patient in procedures of mouth hygiene, the very judicious application by the dentist of measures of oral prophylaxis wherever indicated, and very careful operative procedures, which are still quite an important part of dental practice.

Dr. Frederick B. Noyes:

The object of presenting such a paper and its discussion is the exchange of points of view. No matter what field of thought you may take, any individual devoting the time and energy to its consideration finds himself dwelling upon certain ideas. Another individual studying and thinking on the same problem will find his mind dwelling upon other ideas; and the value of a discussion is to bring that difference of points of view together. I have believed that any man who is looking for the truth has a pretty good chance of finding some of it, and a very poor chance of finding all of it, that his results would be partly truth and partly error, and that the co-ordinating of his view and the views of others would finally eliminate more and more of the errors.

The things I am going to bring up in discussion are brought up in this spirit. There are many things in the paper with which I do not agree at all, with which my point of view for many years has been almost diametrically opposite. For that reason I have been more intested in the paper. I long ago learned never to say that anything was impossible, that anything could not be true, because I did not think it was. Consequently, I do not mean to say that anything in this paper cannot be true. It may be, but I do not think it is. All of the things which I have had to consider for many years have an opposite tendency. I was glad to have had opportunity to read the paper very carefully several times. I am sorry that my discussion must necessarily be more or less rambling.

The first point which crossed my mind is the statement that there is no one organism of dental caries. I do not know that, and I do not think that Dr. Bunting or anybody else knows that at the present time. I am not sure whether there is one or a dozen organisms of caries. The argument is that there is no one organism of caries, because there are many organisms in the mouth which produce acid. That is true. Any culture from carious cavities is a mixture of acid-producing organisms, but that does not prove that all of those organisms are concerned in the carious process. There may be but one of them which really holds in itself individually the crux of the problem of caries. We do not know. More than that, there may be one organism which has as many phases as our old friend streptococcus and which develops the specific qualities which make it virulent in caries production only under certain conditions. We do not know that. What we do not know about the production of dental caries would fill many more books than what we do know. I would not want to make the statement that there is but one kind of dental caries. But we do know that the acid which destroys the tooth in dental caries is the product of microbic action. That much we do know; that it is not an acid in the saliva, or in any other form, but acid which was developed by the action of micro-organism at the spot at which the attack occurs. Whether it is one or more organisms we do not know.

I could not follow the logic of the essayist with reference to the many predisposing causes. The statement quoted seems to me absurd. I could not regard it as anything but humorous. It is wide of the point. We cannot say that all of the conditions of the individual are predisposing causes to dental caries. If that were true there would be as many as there are individuals who have dental caries, because the history of no two individuals is identical. That is carrying a form of reasoning into absurdity, *reductio ad absurdum*, as the logicians say. It destroys itself.

Then, in the classification of the predisposing causes, of which he enumerated four classes, the resistance of the tooth, the localization and perfection of the exciting organism and the concentration of the acids which they produce, upon the tooth. Let us take the first one, the resistance of the tooth. That brings up our ancient friends, it goes back to the days of hard and soft teeth. I want you to examine the logic of the argument for the hardening of the enamel. Suppose we examine unerupted teeth and find imperfect enamel. That, being translated means, enamel in which the cementing substance between the rod is imperfect. You may examine unerupted teeth, taken from their crypts, and find a certain proportion of teeth with imperfections in the enamel. You may examine a tooth from an adult and find a perfect or condensed enamel. It does not follow that that enamel which is now condensed was imperfect. You may also find in the adult imperfect enamel. It does not follow that it has always been imperfect. Think of the difficulty of the proposition. You cannot examine the same tooth before it is erupted and afterwards too, and when you reason from one tooth before it is erupted, to another tooth after it is erupted, you are liable to error, and you have to be very careful how you make statements under those circumstances, and upon what ground you base the statement that the enamel has become harder than it was before, because you do not know what it was before. It is conceivable that the imperfections which exist between the enamel rods may be wholly or partially filled up. There is a good deal of evidence that they are changed, and that they have material deposited in them. A few years ago Dr. Mueller of Berlin presented some work which seemed to show that the brown spots which were old carious spots were more resistant to the beginning of caries than a part of the tooth that had never been attacked. That brown spot had been a white spot. When it was a white spot there were spaces between the enamel rod caused by the solution of the cementing substance through the action of caries. As soon as the white spot began to turn brown it indicated that something had been deposited into those spaces. That is what causes the change in color. In the examination of ground sections, in the laboratory we will seldom find a ground section which does not show some imperfect spot of the surface, some spot where there is more or less solution of the cementing substance from between the rods. Out of a barrelful of extracted teeth you will have a very hard time to find a tooth which does not show some indication of caries upon the surface of its enamel, as shown by the discoloration of the surface which cannot be rubbed off. Those spots mean that the cementing substance was either never formed between the rods or was dissolved out under the influence of acids formed by micro-organisms. But that does not make the teeth more liable to caries unless the destruction reaches the dento-enamel junction. Any amount of polishing will very easily remove that surface portion which has been attacked, as soon as that is removed you are in perfectly vitreous material, which takes a smooth surface. I do not see why we have to look for an explanation and think that the rubbing somehow hardens the disintegrated porous material. I do not see why it is necessary to look for such an explanation, because the polishing of the surface grinds away the disintegrated area. But if the spot is no more liable to beginning caries than it was when it was perfect, why polish it off? There is no doubt in my mind but that the imbrication lines which Pickerill described are present in all teeth, and are much more marked in some cases than in others, and are more marked in those which are susceptible to caries in general than in those not so susceptible to caries. But I do not think they have anything more to do with the beginning of dental caries than the courthouse steps. Teeth which are so imbricated that they are positively disfigured will not decay at all; teeth that are just as smooth and perfect as glass will melt down like snow. The essayist himself said so in his paper. If that is true, why should we waste our time looking for the causes of dental caries in imbrication lines, even as predisposing factors? There is something else that we ought to be looking for, and which calls for our attention so loudy that we have not any time to waste on these things.

The second item was the localization of the products and the protection for the concentration of acids. I thought there was the place where the problem was to be really attacked, and I was amazed to have the paper take those things up from an entirely different standpoint, considering pits and fissures under that heading, and rough margins of fillings and imperfect crown adaptation, and all of the other things that offer mechanical retention for decomposable material. True, anyone can see that those must have some bearing on any such problem; but mechanical retention of foodstuffs is not the key to the problem of caries. But it was the only phase which was discussed in the paper. The amount of carbohydrates in the saliva. The micro-organisms which produce caries do not seem to have any trouble in growing in any mouth. If there is enough carbohydrates for them to grow on, what is the use of determining how much there is? Apparently, if there is sufficient carbohydrate content in the food there will be plenty of carbohydrates for acid-forming bacteria. There is never any deficiency in the food material for the micro-organisms. They are present in every mouth. They thrive in every mouth. But that does not make them attack the enamel of the teeth in every mouth. The carbohydrate content does not appeal to me as an important predisposing factor.

In regard to the assumption of neutralizing factors in the saliva which neutralizes the acid which the micro-organisms produce, we have no evidence on that point, and the very conditions which make caries of the enamel possible are the conditions which would render the presence of such material, if there were any, ineffective and useless.

To return to the calcium content of the saliva and the rejuvenation of enamel defects, there is nothing that I have ever seen in sections that gives any indication that a previously porous enamel is made hard and vitreous again. If there is a porous area it may be worn through and polished by the friction on it.

(Certain lantern slides were exhibited by the discusser, and were commented upon by him.)

That is (pointing to a picture) the photograph of the mesial surface of a central incisor. How often have I seen a man that we all knew and loved stand and pointing to the white spot on the smooth surface of that tooth say: "By what power was the acid confined upon that spot?" In the answer to that question, gentlemen, lies the solution of the problem of caries. And I hope that some day we will have some real search for the answer.

DR. GUY S. MILLBERRY, Dean of the Dental Department of the University of California:

Mr. President and Members of the Chicago Dental Society: It has given me a great deal of pleasure to listen to this paper by Dr. Bunting tonight, and to the illuminating discussions by Drs. Black and Noyes. In the west we have learned to recognipe the earnestness and the sincerity of purpose which characterizes the Chicago Dental Society, when it meets. We have learned of the wonderful success of the various meetings. I had the pleasure of attending your last meeting held at the Hotel LaSalle three weeks ago.

Dr. Bunting in discussing three of the most important problems of dentistry today has opened a question, the discussion of which will probably last for about twenty years, and I am only going to consume a very few minutes of that time.

Passing over the pathology of the root canal infection and omitting a discussion of the pathology of diseases of the peridental membrane, to which we have recently listened on our coast, I should like to express a few views on the problem of the saliva. We have been greatly interested in this problem, I particularly, because of my studies in chemistry and metallurgy, since Pickerill's work came out, and even before that, and not having had opportunity of reading the works published in 1874, as quoted by Dr. Black. I was not conversant with the early history of this subject, but we have been of the opinion that regardless of all this discussion, there is some logic in the statement made by Pickerill, and that is borne out by the psychic and physiologic effects of diet on the flow of saliva, and we are convinced that diet has much to do with the character of the saliva. In my trip from San Francisco to New York, aside from my interest in professional activities and aside from the study of educational conditions, three of the most interesting hours that I have spent, have been, one with Dr. Bunting in his laboratory at Ann Arbor, one with Dr. Gies in his laboratory in New York, and one with Dr. Prinz in his laboratory in Pennsylvania, all three of whom are making some very earnest researches on the problem of saliva, and they all are attacking the problem, each from a different angle, and as near as I can find each of them thinks the other fellow is on the wrong track. I am convinced that these investigations are all serious and earnest, and I think we must all consider these questions with an open mind, that even if we are convinced that some of these statements of Dr. Bunting do not conform to the logic of our own minds, that all of these investigations by whoever made must be viewed with some sort of commendation, and I particularly want to express my commendation, although I cannot see the logic of the calcium content in the saliva, that it has been a potent factor in the problem of the prevention of dental caries. I am of the opinion that it is merely an excretory product. I do want to express my appreciation of both Dr. Bunting's paper and the very sincere discussion of both Dr. Black and Dr. Noyes.

I should like to ask Dr. Bunting in closing the discussion, whether in the analyses of the calcium content of the saliva any correlative analysis has been made of the content of calcium in the urine and the feces?

Dr. Charles E. Jones:

We have been edified this evening by this splendid expositor of real scientific facts. He has given us an excellent essay, in which he has tried to substantiate some of the claims made by himself and other men by clinical findings. But Dr. Bunting's essay did not hold all of our attention this evening, for we have had an opportunity of listening to two very good discussions, by Drs. Black and Noyes; although I do think that these two gentlemen were a little too severe in their criticism of the paper. I do not feel adequately prepared on this subject to take up much of your time in attempting a discussion of the two phases of preventive dentistry presented in the paper; but since there has been some reference made, by both the essayist and the discussors, to the colloidal plaques and their significant relation to caries of tooth structure I feel that I may say something upon that important subject that may be of interest to you.

In addition, and subsequent to the hypothesis of plaque formation, which was offered in the paper which I read before the Illinois State Society and to which paper Dr. Black has so kindly referred, I made some investigations regarding the manner in which plaques were deposited upon the surfaces of teeth. Since it is extremely difficult to produce identical conditions to those found in the mouth, most of our investigations are confined to laboratory experiments, simulating the conditions under investigation, and from which analogies may be drawn. I was able to induce the formation of artificial plaques that would functionate similarly in maner to that which we believed plaques would do in the mouth; that is, these artificial plaques would permit of the phenomena of dialysis. Occasionally, we would find a plaque that would fail to permit the passage of crystalloids, such as mono- and dia-saccharides. This strange action of some of the plaques lead to a rather extensive investigation of the agents and conditions that constitute and form plaques. From various sources it was learned that these plaques were composed of the products of the reaction between the mucin in saliva and the acid produced from bacterial fermentation of carbohydrates in the mouth. Our first great task was to find mucin of the conjugated protein type, other than that which we might find in saliva, in order that we might carry on these experiments in laboratory form. We were successful finally in obtaining a fresh lot of Wharton's Jelly, which seemed to possess all of the chemical and physical characteristics of the mucin of saliva. Wharton's Jelly constitutes the gelatinous connective tissue surrounding the vessels in the umbilical cord, and it is a conjugated protein.

Using the lactic acid bacillus on culture medium that contained from one-half to one per cent of glucose, we were able to produce plaques that would be precipitated out of a solution containing mucin and calcium salts and which had been poured over the cultural field of bacteria. Test tubes of suitable forms were used in this work. Infrequently, but occasionally we would find that after the plaque had been formed that the bacteria would die and that the culture medium would be found excessively acid. This peculiarity of the bacterial cultures prompted us to carry out an extensive line of experiments, from which we formed the following conclusions: That plaques are necessary to the process of incipient caries; that plaques are either the precipitated, or coagulated, mucin content of saliva formed from the reaction between the acid, incident to bacterial splitting of carbohydrates, and the mucin; that neither an excess of acid nor of mucin regulates the amount of decay; that the power of the acid to limit its action to the extent of precipitation and not coagulation determines the process known as caries.

In order that we might have some ground upon which to base the opinion that it was the precipitated plaque and not the coagulated one that permitted the dialysis of crystallodial saccharides and inorganic salts, a great deal of work was done with various isomers of lactic acid. It is known that fermentation lactic acid is optically inactive. This optically inactive acid seemed to have the power of only precipitating and not the power of coagulating the mucin, as did the acid which we occasionally found to be dextrogyre. In fact, long before our work was discontinued, we were of the opinion that whenever the analyzer of our polariscope showed that the lactic acid, that was produced from carbohydrate food remnants, polarized the light rays dextrorotatory or bent them levorotatory that the acid in similar dilutions to those which we thought occurred in carious processes, would coagulate the mucin and thus prevent it from becoming a dializing membrane. Bacteria would not live under a plaque thus formed. From these findings we reasoned that it was the precipitated plaque that enabled bacteria to carry on their life functions, because the precipitated plaque alone permitted of an arrangement whereby the bacteria could rid their place of habitation of deleterious debris, by exosmosis of such products as calcium lacto-phosphate and obtain sufficient food for their sustenance by endosmosing mono- and dia-saccharides—but not poly-saccharides, because they are of a collodial nature.

The question then of whether the mucinous plaque has been precipitated, or coagulated, when thrown down upon the surfaces of teeth seems to me to be an all important factor in regulating the partial or total immunity noted in some mouths. Perhaps the virulency of the bacteria and their ability to split the carbohydrates into acids of a character that will act either as a precipitator at one time or as a coagulator at another, may be the controlling factor.

There is just one thing of which we are certain, and that is, that if the bacteria that live in the mouth and indirectly form plaques as suitable places for their habitation, are frequently disturbed in a physical way that they will become attenuated and unable to ferment food debris into deleterious acids, and no plaques will be formed. This physical disturbance can in many instances be accomplished by the patient, after the dentist has placed the mouth in a condition to favor hygienic measures. So this propaganda of Oral Prophylaxis is worthy of our consideration if it teaches our patients to care for their mouths and teeth after we have placed these parts in shape so that they may be cared for.

It is an irrefutable fact that caries of the teeth may be entirely prevented by one or all of the following measures: Removal of all carbohydrate particles from the mouth; reduce the virulency of the bacteria by frequent agitation, thus decreasing the amount of acid formed; by preventing the precipitation of plaques upon the surfaces of the teeth, or hasten their removal soon after lodgement. That all of these things may be accomplished by assiduously practicing hygienic measures is well known to the members of the profession.

Regarding the possibility of repairs being made in tooth structure that has structural defects, I question the dialysising properties that Pickerill attributes to Nasmyth's membrane. Calcific metabolism is too intricate for us to expect that calcium salts would be taken up and combined with tooth structure even if some of these salts were transferred from the saliva to surfaces of the teeth by dialysis.

Dr. Bunting (closing the discussion):

I certainly appreciate the form of the discussion and the spirit in which it has been given. I know the previous speakers well enough to know that they have been actuated by the desire of correcting certain statements with which they cannot agree. And, indeed, that is the purpose for which I came here tonight, to obtain your viewpoint of this question.

I am living with this subject every day. I am thinking it all the while, and I could talk about it until tomorrow morning, but I have no intention of doing so. I have the greatest regard for the scientific ability and personal observations of the two first gentlemen who discussed my paper, and yet I regret very much that they have not seen the things which I have described in my paper, which I know just as well as I am standing here, are true. I have seen them and I know it, and they, too, would see them if they would go along the same road that I have gone. (Applause.)

I will discuss a few points that have come to my mind. Dr.

Noyes said we did not know whether or not there was a specific organism of caries. I have in my possession a large number of slides of carious teeth which have been stained for bacteria and similar sections are shown in Miller's Bacteriology, in which the furthermost penetration of the bacteria, into the dentin could be seen where they had gone out along the separate individual tubuli, and in many instances they were in pure culture. But were they always the same form of bacteria? No. In some cases they were short rods, in others long rods, and in still others large and small streptococci. I have also specimens in which there are threads, and I have even found one with the pure culture of the Jodococcus. Is not that proof that there are a number of organisms which may penetrate the dentin?

I cannot say what the specific organism is in the enamel, but in the dentin I do know that there are a number of different kinds of bacteria which grow in pure culture to produce caries.

In regard to the pitting of the enamel I have been seriously misunderstood by both of the first two gentlemen who discussed the paper. They thought that I imagined that there were holes in the enamel whereby the bacteria, one by one, crawled as down a sewer-pipe into the tooth, and thereby brought about its destruction. Not necessarily so. I am not certain as to the effect which these enamel parasites may have upon caries, but I do know this, that they are there, and that they are pervious to liquids of the mouth and the acids of caries. As Dr. Noyes threw upon the screen sections which have been produced in a late article by Dr. G. V. Black, an article which showed sections of teeth which had come from the district near Denver, he presented section after section showing a coloration of the enamel by a certain brown stain, and I have in my possession sections which appear exactly like them. In these the coloration is produced by the penetration of silver nitrate from the outer surface. These teeth were not of a unusually poor grade, but were the ordinary teeth obtained from the extraction specialist. They have been kept wet and never were dry from the time of their extraction and were preserved as nearly as possible in their original condition. It is quite possible that the discoloration of the teeth shown by Dr. Black are not discolored because of unusual malformation by the presence of some staining substance in the food or water which may permeate the openings which are present in the majoirties of enamels. This parasite is not unusual. It is usual.

But I have been criticized for saying that teeth should be polished. All teeth do not need to be polished as many have a fine high glaze upon them, and it is not necessary to reduce that form of tooth. But the rough tooth, the tooth that is not smooth, the tooth that is like unfinished wood should be smoothed. Why should this be done? The chief reason for smoothing the teeth is to increase the general self-cleansing power of the mouth. You know perfectly well that you can take a cloth and wipe off a polished surface of wood and easily clean it, relatively well, but the surface of the unfinished and rough cannot be so cleaned.

Likewise a large percentage of the mouths in our practice cannot be kept clean with the tooth brush because of the roughness of the tooth surfaces and other areas of mechanical retention, but if the rough surfaces of the teeth are smoothed and they are polished, the patient by proper care can keep his mouth clean and can reduce the amount of fermentation in it.

I am surprised that Dr. Noyes has objected to the statement that the amount of retained carbohydrates has an effect upon dental caries, and bases his objection upon that ground that bacteria grow in all mouths. This statement betrays a lack of personal experience on his part with the behavior of salivary bacteria. Work which we have published, shows conclusively that the bacteria do not produce any considerable amount of acid when grown upon clear saliva or salivary mucins. But when carbohydrates are added, acid is formed readily, and the amount of acid produced, is in direct relation to the amount of carbohydrates present. Retained and concentrated carbohydrates about the teeth, certainly do enhance acid production by bacteria, and if other conditions permit, will produce caries.

Dr. Noyes accuses me of being illogical in my statement regarding the probable condensation of enamel surfaces after eruption and during prophylactic treatment. He objects to such an inference because we cannot examine such teeth microscopically both before and after such change. In reply I can but refer him to the methods by which our knowledge of all embryology and growth processes have been gained. In the study of developing teeth, for instance, we cannot follow the same individual tooth or jaw from anlage to maturity, with microscopical examinations, but rather we have based our knowledge on the observation of a large number of cases taken at various stages in the process, and have attempted to correlate them one with the other. So in our obesrvations upon the permeability of the enamel, although they are in their infancy at the present time, certain definite relationships are plainly seen to exist, which strongly support the statements made in the paper. We have actually been able to change a porous enamel surface to a dense one, outside of the mouth, which change I emphatically assert was not made by the grinding off of the porous outer surface as claimed by Dr. Noyes, but by an interstitial condensation, the nature of which is not at the present time clear to us. This we can prove by actual controls in the same teeth.

I have been misunderstood by some who believe that I came to Chicago to tell you that the only prevention of dental caries and of pyorrhea is to polish the teeth. As I clearly stated in my paper I came to you with a keen regret, that on looking over the whole field of preventive dentistry, I saw nothing of proven value in the way of preventive measures other than strict oral hygiene. Not that these measures are always satisfactory but that they are of value and are at the present time the only known practical method of prevention. And indeed, has either of these gentlemen suggested anything better? What are they doing in this regard? What do they suggest? They tell us that polishing and cleansing the teeth will not prevent, that it is not in this or that, but it is in something else, which they do not understand. One thing I do know, I have been in the offices of prophylaxis specialists, I have been in the offices of many people who are practicing sane prophylaxis to a greater or lesser degree, I have made it my business to examine their patients to see whether or not prophylaxis in the highest sense really does prevent, and I have personally become convinced that *it does have its effect.* In spite of all the unkind things that have been said tonight about it I reaffirm *Prophylaxis does prevent.*

I am going to get on common ground with both of these men by saying that I believe they are correct when they state that the crux of the whole matter lies in the mucinous plaque, whatever it may be, the peculiar condition which confines bacteria and their acids to one particular place in the tooth and produces the spot of beginning caries, and I would like to see someone who could suggest something to us which would shed further light on this subject. I would like to see someone follow out the work that Dr. Jones mentioned just a few minutes ago. It is worth while. But even if we knew the difference between a good plaque and a bad one how are we going to prevent the bad sort of a plaque from forming? Just as Dr. Milburn said, we are going to spend twenty years perhaps in studying it, but in the meantime is it not a sane and sensible practice, that if we know that plaque has a good deal to do with the beginning of caries, to go about the teeth occasionally and rub it off? Would not that help? I know it does, for I have seen it to be true and I am certain of it.

I saw plainly in the minds of the first two discussers that they thought Bunting had lost his head and gone off on a tangent. It is the prayer of my life that in this work I may at least keep sane. I want to keep my feet on the ground, and that is the reason I came here tonight to have this discussion. Two years ago I was in exactly the position that these gentlemen are tonight. I thought that a man, in order to practice prophylaxis had to be a crank and to get enthused and to go off the handle, and I doubted whether the things he saw were there at all. But as I say, I have made it my business to find out for myself. I have carried it out under my own personal supervision in a limited way. I am teaching some of the more safe and sane methods in our school. I will say in closing that, in spite of the high regard that I have for these two gentlemen and their opinions on this subject, that they have not convinced me that I am wrong, and I am certain that if they will do the same things that I have done they will change some of their opinions about this very subject.

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EDITORIAL.

THE KANSAS CITY MEETING.

On March 20-26, 1916, the three States of Kansas, Oklahoma, and Missouri joined in a meeting at Kansas City, Mo., which will be memorable in the history of dentistry in the West. More than one thousand men representing eighteen states were in attendance, and there was an intensity of interest throughout the week that surpassed anything ever witnessed at a similar gathering of dentists. From Monday when the meeting opened till Saturday afternoon when it closed there was never a lapse in the attendance nor a lag in the interest. The audience would sit for three hours in succession listening to lectures and then ask for more. The meeting was conducted on the lecture system entirely, no clinic being given. The lecturers were Drs. Thomas P. Hinman, Atlanta, President of the National Dental Association; Forrest H. Orton, St. Paul; M. L. Rhein, New York; Richard H. Riethmuller, Philadelphia; Weston A. Price, Cleveland; and J. P. Buckley and C. N. Johnson, Chicago.

To go into details regarding the meeting would be superfluous and in fact impossible, on account of the many and varied features of interest; but to show something of the spirit manifest it is only necessary to state that after Dr. Price's lectures more than $6000.00 was raised for the Research Fund of the National Dental Association. When it is realized that each man at the meeting had paid $5.00 for the privilege of attending the lectures, such a contribution as this speaks volumes for the liberality of the dentists of the West.

A conspicuous feature of the meeting was the excellence of the reports in the daily press of Kansas City. Throughout the week the reports were interesting, dignified and instructive; and the press reporters were apparently bent on giving only accurate and faithful information as to the matters emphasized by the speakers, instead of straining at effects through the medium of buffoonery, as has too frequently been the case in the past. Hats off to the Kansas City papers.

The success of this Tri-State meeting was due to the untiring efforts of the officers and committees in charge. They all worked together with a will and each is entitled to a full share of praise. If any one man could be singled out of the whole noble band of workers for special commendation, it would be Dr. C. R. Lawrence of Enid, Oklahoma—the Secretary-Treasurer of the Organization Committee. Dr. Lawrence worked in season and out, not only with earnestness, but with a particular genius for such work—to the end that at the banquet he was presented with a beautiful gold watch by his confreres as a token of their esteem.

Altogether this meeting will long stand out as an important mile stone in dental progress, and our congratulations are herewith extended to those associated in its management. The proceedings are to be published in our esteemed contemporary the *Western Dental Journal* of Kansas City, whose editor is Dr. Charles Channing Allen, Chairman of the Organization Committee.

A GRACIOUS ACT OF THE ST. LOUIS MEDICAL SOCIETY.

We are indebted to the kindness of Dr. Burton Lee Thorpe for a copy of the March 2, 1916, number of the *Weekly Bulletin* of the St. Louis Medical Society containing a resolution passed by the society at a recent meeting. It is published as the leading article on the editorial page, and is as follows:

> THE NATIONAL DENTAL ASSOCIATION
>
> The following resolution was unanimously adopted at the last meeting of the St. Louis Medical Society:
>
> Whereas, modern dentistry is an aid in the prevention and cure of many grave constitutional diseases as well as in the maintenance of general health, and

> Whereas, the character of wounds about the head and face inflicted by modern implements of war makes the services of competent dentists an indispensable aid to the Army Surgeon in time of service, and
>
> Whereas, the efficiency of the Army both in times of peace and war depends primarily upon the physical fitness of its members, therefore be it
>
> Resolved, That the St. Louis Medical Society heartily endorses the action of the National Dental Association in seeking such legislative enactments as will offer inducements to the better class of dentists to enter the Federal Service, and be it further
>
> Resolved, That it petitions Missouri representatives in both branches of our National Assembly to support the efforts of the National Dental Association to secure three additional grades in the Dental Corps of the United States Army.

When a prominent medical society makes so gracious an acknowledgment of the value of dental service, it goes a long way toward bringing medicine and dentistry into closer relationship. As intimated in the resolutions the present great war is doing much to show the interdependence of the two callings, and there should develop as a result a closer association and more frequent consultation between medical men and dentists. If it is true, as has been generally conceded since the war began, that the surgeon needs the services of the dentist in the management of those cases which involve the head, face, and jaws; it is just as true that dentists have very much to learn from the medical profession. We can profit by emulating their breadth of vision, and particularly their diagnostic methods. The weakest place in dentistry has been diagnosis, and the failure to recognize pathological conditions in their incipiency. The medical practitioner is trained in this and is alert to tissue aberrations, a faculty which the dental profession would do well to cultivate. A closer communion between medical men and dentists will result in a better service to the people and this is after all the *summum bonum* of professional effort. Our thanks go to the St. Louis Medical Society for their resolution, and their publication of it.

THE EDITOR'S DESK.

TOURING WITH THE PRESIDENT.

Of course I mean the President of the National Dental Association and not the President of the United States. With due respect for the distinguished personality and office of the latter, I am frank enough to state that I would prefer touring with the former—I know him better. Dr. Thomas P. Hinman and I left the Tri-State meeting at Kansas City together and journeyed to Little Rock, Ark., to attend the Arkansas State Dental Association annual meeting. At this point I wish to serve notice. I have properly identified my companion as Dr. Thomas P. Hinman, but this is the last time I shall call him that in this article. Henceforth he shall be known to my readers as he is known to all of his many friends, South, North, East and West, as "Tom" —just "Tom." The only variation I have heard from that is by one of his friends who calls him "Marse Tom."

Well, anyhow, we went to Little Rock, and were met at the station by two of my old friends and one new one. Tom and I were to be the guests of Dr. J. E. Hancock, formerly of Chicago, during the meeting, and meanwhile—there was a day between our arrival and the opening session—we were to be given an automobile trip to Hot Springs by Dr. Y. E. Whitmore of Little Rock. These two gentlemen were on hand to meet us together with Dr. J. D. Jordan, chairman of the Program Committee. There was an air of true Southern hospitality apparent at once, and as soon as we could change our hats for caps and put on some heavy overcoats we were off for Hot Springs. To those who have followed my meanderings up and down the earth in this department it is unnecessary to announce that automobiling across the country is my one supreme craze. I named Dr. Whitmore's car the "Phoenix" because it had been burned once, and he had built this car from the remains. If the process always turned out as satisfactorily as this it would pay to burn most cars and have them rebuilt. That car was a wonder. The roads were—hold on, I promised not to say anything about Arkansas roads outside the state. There had been rain, and then there had been more rain, and then a little more. Some of the roads had a bottom to them. I know this because we struck it at times. Other roads I am not so sure of, because we never did touch bottom. But that car could swim. Which reminds me that in Arkansas a car must learn to swim, otherwise it is of no use. They are too lacking in the artificial in Arkansas to build bridges or culverts over the streams, and except in the largest rivers a car has to go through water. They have a sign post stuck in the bank at the side of the road indicating the depth of the riverbed so a driver knows at once how many feet of water his car must negotiate in order to get across. It is a wise provision of the municipality to do this. I am told that the object of leaving the crossings unhampered by bridges is for the purpose of washing the car every few miles, or to rinse off the feet of the mules as they wade through. Arkansas mules are said to be very particular about their feet, especially their hind feet. I was told that one of those mules would live a blameless life for a hundred years for the purpose of throwing people off guard so as to get a chance to kick the daylights out of some one with those hind feet. But, looking at those mules, I could not believe it. I like mules anyhow, but that is another story.

We started for Hot Springs Sunday shortly after noon, and we had the ride of our young lives. It was exhilarating to get out in the open air after those days of incessant lecturing and that long ride on the train. I sat in front with Dr. Whitmore, helping him locate the road, while Tom was in the tonneau hanging on to the grips and trying to hold the hind end of the car down. He didn't always succeed. That car's long association with Arkansas mules has given it some peculiar ideas as to what it should do with its hind end, and much of the time it was in the air. It didn't seem to care a rap that it had the distinguished President of the National Dental Association in the tonneau. It tossed him about in a most undignified manner till finally it put a goose egg on his head by bumping him against the bow of the top. And then it put another. The top was the only thing that saved the President from landing over in a field. Dr. Whitmore had left the top up, ostensibly because it was drizzling rain, but really, I believe, because he wanted to hold us in the car. But it must not be supposed that it was hard riding. It was the reverse. Dr. Whitmore had gone over his car most carefully and wherever there was the slightest space he had hung a shock absorber. It really looked as if the car had been built around an assortment of absorbers. So we rolled along most comfortably, with the trivial exception of Tom's goose eggs.

The country was intensely interesting to an unsophisticated Northerner, and the season of course far advanced. It was

March and the peach trees were in bloom, forming a beautiful contrast to the brownish gray of the landscape. Then there was the birdseye—a blossom I had never seen before—looking at a distance something like the bloom of the peach, though on a wider-spreading tree. But the chief glory was the dogwood, white as the driven snow and pure in tone as a lily. Tom entertainingly pointed out to me the different varieties as we rode along, and I marveled at his familiarity with everything in nature from trees to birds. He had just called my attention to an especially fine specimen of the dogwood, when I said: "How do you manage to distinguish all these trees?" "Why," said he, "that's easy. For instance, you recognize the dogwood tree by its 'bark.'". The only reason that Tom is still alive is because I did not want to deprive the National Dental Association of its presiding officer at the next annual meeting. For one brief moment I reveled in the reflection of those two goose eggs on Tom's head, and he lost out on a heap of sympathy by that chance remark.

Hot Springs has been described so many times that I forbear, particularly as I know almost nothing about it. We drove in just before dark, and registered at the hotel. Then Dr. Whitmore began to tell us of a wonderful chicken dinner that was to be had out in the country about six miles at another spring. The car did not seem to have had enough running to suit it, and we surely had not had enough riding, so away we went. We soon learned that the "about six miles" was a mere figure of speech. Dr. Whitmore drove on and on till Tom and I declared that he had lost his way. I wanted to ask him if he was headed for Galveston, Texas, but I was a guest and it would not sound gracious. Finally, when I had lost all hope he gave the wheel of the car a twist and we ran up on a gravel drive in front of a house. There we were. We entered a cozy parlor, sat down by the fire, and had just time enough to get our "sea legs," when dinner was announced. And such a dinner! It would have been worth while traveling all the way to Galveston to get that dinner. I am ashamed to say how much we ate, but it was all comfortably jolted down by the time we had driven back to Hot Springs.

Next morning we visited one of the bath houses—the Fordyce, and were shown through. It was easily the most complete and luxurious place of the kind that I had ever seen, and if a man could not be made well from all his aches and pains in that establishment it would simply be because his troubles were organic instead of functional, or because they were all in his mind. And even then I am not sure that the bath would not go a long way toward curing him. Mental impressions such as this establishment radiates are a very important factor in healing the sick, and everything about the place seems to make it so easy to be well and so hard to be ill.

But all the while we were in Hot Springs I knew what was on Tom's mind, and I knew what was on mine, and Dr. Whitmore read us both like a book. "I believe you men would rather be out in the country climbing the Arkansas hills in a car than to see the sights of any town." And so we started toward Little Rock, driving a different route back, and enjoying every minute of it. I took compassion on Tom and put him in the front seat where he could not bump his head, and then what do you suppose he did? Simply took a piece out of his finger on the emergency brake. "Anyhow," said he, as Dr. Whitmore bandaged the finger, "I'm immune now. That is the third crack I have had on this trip." And he, the President of the National Dental Association! Evidently fate is no respector of persons, because the other two of us got off without a scratch.

We drove to Malvern for dinner over some very tempestuous roads where we had to use the chains to negotiate the miry hills. But we soon forgot our difficulties in that dinner. I am wondering if all the cooks in Arkansas are good, or if it was merely because Dr. Whitmore knew just where to look for the best ones. We did not encounter a poor meal on the trip. I felt quite at home in Malvern because I learned that the proprietor of the hotel formerly lived in Chicago. Anyone who has ever lived in Chicago is a friend of mine on sight.

We then drove to Beauxite, the big aluminum works, where we were shown through with much courtesy. It is said that more aluminum is mined here than in any one place in the world, but I have not time to go into this.

Our next stop was Benton, still in Arkansas, though I thought surely by this time we must have driven across into Georgia after covering so much beautiful territory. By the way, at this point permit me to warn you about the pronunciation of that word Arkansas. I had seen it written oftener than I had heard it pronounced, and on one fatal occasion as Tom and I were riding along in Little Rock with Dr. Hancock I permitted my intelligence to slip sufficiently to pronounce it as it is written. Gently, politely, kindly, considerately, patiently, courteously but firmly, my host said: "Doctah—A-r-k-a-n-*s-a-w,* please." That was sufficient. If they had waked me up in heaven early the next morning I would have rubbed my eyes and asked: "Is this Ar-kan*saw,* please?"

Benton is noted for its production of pottery, and we spent a most enjoyable hour in the famous Niloak pottery, of which the presiding genius is Mr. C. D. Hyten. We had the pleasure of seeing Mr. Hyten turn up some of the most beautiful specimens of vases from the native clays of different colors, for which this region is noted. There were blues, grays and browns mingling in such wondrous patterns that it was a fascinating sight. It looked so easy to see Mr. Hyten do it that Dr. Whitmore said: "I believe I could turn up a vase like that." "What do you think about it?" asked Mr. Hyten, turning to Tom. "I think I could learn how," modestly said the President of the National Dental Association. And then he asked me. I played right into his hand by saying: "I doubt if I could ever learn to do that beautiful work." "You're nearer right than either of them," he said. "No man can ever learn to turn these vases unless he starts as a boy and is brought right up with the business. As we left the place Dr. Whitmore said: "I'm going back there some day, and show him that I can turn a vase." Ever since I have been patiently waiting for the latest returns from the front.

We drove into Little Rock just as people were going home from work, and that night enjoyed the delightful hospitality of Dr. Hancock's home. As before stated, the Doctor formerly practiced in Chicago, then went to Little Rock, and finally graduated out of the practice of dentistry into the banking business. He is now manager of the savings department of the Mercantile Trust Co. and is industriously engaged in the fascinating pursuit of showing the people of Arkansas how much money can be accumulated by starting with a penny and doubling the amount each day for a month of thirty-one days. Figure it up and see. You will be a millionaire while you wait.

Dr. Hancock has a charming wife and a little boy who is a live wire. I wanted to bring him home with me, but he had too much to do in Little Rock.

Southern hospitality is proverbial the world over, and I shall never forget my visit to Arkansas. In addition to those already mentioned there was endless courtesy by the members of the Arkansas State Dental Association. The president, Dr. Elbert Stewart, arranged the program for my especial convenience, so that I might make an early train, and the secretary, Dr. W. B. Dorman, did all in his power to make my stay a delight. Dr. Whitmore stuck to me to the last moment and drove me to the station with his "Phoenix"—a car that I shall always remember with affection. No other car could have given us more pleasure or put more artistic goose eggs on the head of the President of the National Dental Association.

All hail to Arkan*saw*!

BOOK REVIEWS.

THE PRACTITIONER'S MEDICAL DICTIONARY. By *George M. Gould,* A. M., M. D. Author of "An Illustrated Dictionary of Medicine, Biology and Allied Sciences," "The Student's Medical Dictionary," "Pocket Medical Dictionary," etc. Third Edition —Revised and Enlarged. By R. J. E. Scott, M. A., B. C. L., M. D. Fellow of the New York Academy of Medicine. Editor of Hughes' "Practice of Medicine," Gould and Pyle's "Cyclopedia of Medicine and Surgery," etc. Based on recent medical literature, with many tables. 962 pages. Flexible cloth and leather, round corners, marbled edges. Cloth, $2.75; thumb indexed, $3.25; leather, $4.00; thumb indexed, $4.50. Published by P. Blakiston's Son & Co., Philadelphia.

The new edition of this standard work has been brought out in a very satisfactory form. It is light and convenient to handle, and yet it is comprehensive enough to answer the purpose of a modern, up-to-date dictionary. The type has been reset throughout, and the editor has included nearly 20,000 new words; the volume now containing 70,900 words and terms with their pronunciation. When it is remembered that the various editions of Gould's Medical Dictionaries have reached a sale of nearly 400,000 copies it is unnecessary to give a further endorsement of the present work, except to say that it is more attractive than the previous editions and more convenient to use.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Remove the Stain of Iodin:—Iodin stain can easily be removed from dental napkins and other fabrics by washing the spots in ammonia water.—*H. A. Cross, Chicago, Ill.*

Bibulous Paper Preferable to Cotton:—Once accustomed to using bibulous paper and you will have very little use for cotton Its absorbent qualities are ten times those of cotton.—*E. J. Perry, Washington, Iowa.*

To Light Gas Without a Match:—Some time you may want to light your gas or alcohol lamp quickly and have no match within reach of your free hand. If your electric cautery is convenient it will do the lighting for you.—*J. F. Nelson, Washington, Iowa.*

To Prevent Checking of Porcelain in Casting:—When casting on porcelain turn the investment over immediately so the button of surplus gold is excluded from the air, allowing the whole to cool evenly. The facing will not check when this is done promptly. This also applies to solder work.—*J. S. Bridges, Chicago, Ill.*

Soft Wax for Gingival Margin:—In some inlay cavities it is difficult to secure a good impression of the gingival margin with hard inlay wax. In these cases after attempting the impression with hard wax, add soft wax to the cavity side of the impression. Warm the whole slightly and replace in cavity, having patient bite, etc. An accurate impression can be obtained in this manner.—*Albert E. Converse, Springfield, Ill.*

Do Not Use Lubricants on Silicious Fillings:—When a matrix is used during the insertion of a silicious cement filling, never put any lubricant on it. The smallest amount passing into the filling will seriously injure it. A clean, dry celluloid strip can be used to bring the filling to place, and make the contour and if it is held firmly for two or three minutes it can be removed without injuring the filling.—*Robt. J. Cruise, Chicago, Ill.*

Contact Points on Silicate Fillings:—In filling proximal cavities with silicate materials sufficient separation should be obtained to allow for thickness of celluloid strip. If not, no matter how perfect the margins, that filling is a failure because the all important contact point is lost. Contact point (hand-made) should be, nearly as is possible, like the geometrical "point." In some silicate fillings that point extends from incisal to gingival margin.—*C. M. C., Chicago, Ill.*

Cementing an Inlay:--In cementing a gold inlay, malleting the inlay by using a stiff, strong orange-wood stick will give excellent results in seating inlay. This method is followed by rigid burnishing and finally having patient put full strength of muscles in closing teeth after a piece of orange-wood about one-eighth inch long and squared on all sides has been placed on the inlay. This throws full pressure on the inlay tending to drive inlay further to place and overcomes any possibility of heaving while cement is crystalizing.--*W. D. N. Moore, Chicago, Ill.*

Matrix for Large Restorations:—Use very thin copper, make band somewhat larger than the tooth, fit to tooth by pinching tight with pair of pliers, as you do in orthodontia work, fold this surplus over tight against band with your collar pliers and use as ordinary matrix band. When ready to remove simply unfold the part you folded down and it is easily removed. To solder the joint of such thin metal snip a place in one end of strip and place other end in it and press tight with pliers, which will hold the ends together while soldering.—*E. T. Evans, Decatur, Ill.*

Black Arsenious Mixture:—Now is a good time to remember and quote what Dr. G. V. Black has told us. Twenty years ago he said in a Chicago meeting, "Always mix a little lampblack with your arsenic for application to pulps. Then you can see exactly where it is placed, and detect if any crawls out to the edge of the cavity." I have done this ever since; wouldn't think of using a mixture without it. And whenever I use it I think of Dr. Black and very likely glance at his picture on the wall. Do this at once, brother or sister, lest you forget. Do it now and you will always.—*Garrett Newkirk, Pasadena, Cal.*

Taking an Impression of a Cavity:—To get impression for porcelain inlay, where cavity extends under the gum line, prepare cavity as usual. Bend piece of rigid metal to make a half cylinder, then cut end of said half cylinder to fit convexity of the tooth neck. Have modeling composition ready, warmed, on a stiff spatula-shaped instrument, push gum back with this metal until upper edge of the cavity is exposed, reheat modeling composition and press into the cavity. The metal forms a matrix which keeps the modeling composition from spreading around under pressure, and gives a very fine, clean-cut impression.—*C. E. Allshouse, Chicago, Ill.*

To Use Old Wax Again and Make Useful:—Place all your old wax in a large deep pan of water and boil. While wax is still hot, fill a medium size glass bottle with cool water and cork bottle and tie string around neck of bottle so you can handle it. Then use soap and water outside of bottle, washing off excess of soap and water. By doing this wax will not stick. After this is done drop your bottle down in the hot wax, drawing it away once or twice or as many times as desired. When bottle is drawn out of wax, let it cool for a few minutes, strip off the wax from bottle and cut into sheets as desired. You then have wax ready for use.—*Elkan W. Fishell, Chicago, Ill.*

Narrow Bicuspid Spaces in Bridgework:—How often we find the bicuspids must be replaced with a bridge from first molar to cuspid and the space is too narrow for two bicuspids and too wide for one. Such cases can be artistically restored by using a thick, wide molar facing which fills the space, grinding the buccal and occlusal surfaces, to resemble two bicuspids. Use a sharp knife-edged stone while grinding buccal surface. It is not necessary to cut through the facing; simply grind to give it the appearance of two bicuspids, then finishing the lingual and occlusal surfaces in the usual manner by casting. By this method one platinum pin is near the center of each bicuspid reproduction. If two narrow bicuspid facings are used they look like rat teeth. Grind a wide molar facing by this method and keep for future reference.—*W. O. Fellman, Oak Park, Ill.*

To Repair Vulcanite:—As there are still complicated methods of repair advocated, I will for the benefit of young dentists again detail a simple method without solutions or pressure, a method used successfully for many years. If a central fracture of an upper denture, replace the parts and invest. Then with a small carborundum stone grind the rubber from the fracture about one-quarter of an inch on each side making it thin at the fracture and with a shoulder at the sides. Cut rubber in quarter-inch pieces, and with a hot spatula pack the rubber with a rubbing motion until the space is filled. Do the same on the labial fracture, then flask and vulcanize. If a tooth is to be replaced, file away some of the rubber where the pins were, hold the tooth in place with the finger and pack new rubber into position with a hot spatula. Then vulcanize.—*L. P. Haskell, Chicago, Ill.*

An Efficient Polisher:—To a brass chuck of a laboratory lathe solder a brass plate 2x2x⅛ inches. With a suitable rest and an instrument made from an old gold file the brass may be turned and trued to a 2-inch disk on the laboratory lathe. Drill holes and screw a well seasoned white pine board 6x6x½ inch to the plate, and turn to a face plate for holding sandpaper disks. Take a concave tin disk 1½ inches in diamater and pass through it the screw belonging to a lathe chuck and solder. When this is inserted in a hole in the center of the face plate it engages, and the moment the lathe is started the concave disk clamps the sandpaper and holds it firmly. These sandpaper disks may be employed for a variety of purposes, sharpening slate pencils for use in soldering, smoothing the rough edges of glass slabs, shaping and grinding steel instruments, and dressing rubber plates as they come from the vulcanizer. —*J. T. Search, Onargo, Ill.*

Euca-Percha V. Zinc Oxid Formalin Cresol Compounds for Root Fillings:—Experience seems to show that the various compounds of zinc-oxid formalin and cresol as made up by various manufacturers, though valuable for dressing septic roots and reducing septic conditions are not suitable for permanent fillings. It is the practice of many dentists to use these preparations followed by a gutta percha point for permanent work. Apart from the fact that there is no filling permanently antiseptic, if these fillings be examined after a lapse of time there will frequently be found a shrinkage, leaving a space which causes the formation of irritating gases. The euca-percha paste carefully pumped into the canal followed by gutta percha points forms a homogeneous plug; any excess of eucalyptol being displaced by moderate pressure or taken up by the substance of the tooth if slightly dehydrated.—*A. G. Salisbury, Takaka, New Zealand.*

MEMORANDA.

THE TENNESSEE STATE DENTAL ASSOCIATION.

This Association meets in Knoxville, Tennessee, June 20-21-22, 1916, H. C. Maxey, Secretary, Memphis, Tenn.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will hold its next meeting at the Seelbach Hotel, Louisville, Ky., July 22 and 24, 1916. Charles Channing Allen, Secretary, northwest corner 10th and Troost, Kansas City, Mo.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing June 12th, and continuing six days. For application blanks and full particunlars address Dr. Fred J. Prow, Secretary, Bloomington, Indiana.

The next meeting of the Iowa State Board of Dental Examiners for the examination of applicants will be held at Iowa City, Iowa; commencing Monday at 9:00 a. m., June 5th, 1916. For further information address the secretary, J. A. West, Des Moines, Iowa.

The Illinois State Board of Dental Examiners will hold their next examination at the Northwestern Dental School, 31 West Lake Stree, Chicago, commencing June 15th at 9 a. m. Application blanks and requirements can be secured from the Secretary, Dr. O. H. Seifert, Springfield, Ill.

NORTHERN OHIO DENTAL ASSOCIATION.

On Thursday, Friday and Saturday, June 1, 2 and 3, the Northern Ohio Dental Association will hold its annual session at Hotel Statler, Cleveland.

Dr. G. D. Lovett, 630 Rose Building, will mail programs to non-members upon request. Clarence D. Peck, Secretary, Sandusky, Ohio.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, S. D., July 11, 1916, at 9 a. m. sharp, continuing three days. All applications must be in the hands of the secretary by July 1st. Fee $25. Address Robert Jasmann, Secretary, Scotland, South Dakota.

THE WYOMING STATE DENTAL ASSOCIATION.

Wyoming State Dental Association will meet in Casper, Wyoming, on June 19 and 20. As this is the first meeting of the Wyoming State Association we hope to have a rousing meeting. A cordial invitation is extended to all members in good standing, of the National Dental Association, or of any state dental society. Peter Appel, Secretary, Cheyenne, Wyo.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners will hold their 34th annual meeting in Louisville, Kentucky, July 28th and 29th, 1916. All State Boards, not members, are urgently requested to become associated with this organization, for the promotion of uniform standards, higher qualification and mutual benefits to be derived from a more intimate acquaintance. For further information address the secretary. Dr. J. A. West, Secretary, Des Moines, Ia. Dr. C. M. McCauley, President, Dallas, Tex.

BOARD OF DENTAL EXAMINERS, STATE OF WYOMING.

The Wyoming Board of Dental Examiners will meet to hold examinations of applicants at the state house in Cheyenne, Wyoming, on the 27, 28 and 29 of June. The written examination consists of Anatomy, Physiology, Histology and Bacteriology, Chemistry and Metallurgy, Oral Surgery, Anaesthetics, Operative and Prosthetic Dentistry, Materia Medica and Therapeutics, Prophylaxis and Orthodontia. Applicants must present a full plaster model of upper and lower jaws with teeth, and also one without teeth. Practical work will be required from all candidates taking examination. The candidate is required to furnish his own operating instruments, dental engine, amalgam, gold, wax and modeling compound. For further information and application blanks, address Peter Appel, Jr., Secretary, P. O. Box 643, Cheyenne, Wyo.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN.

140 The Fenway, Boston, Mass.

UNDERGRADUATE ASSISTANTS.

During the months of June, July, August and September an opportunity is offered by the Trustees of the Forsyth Dental Infirmary for Children to a limited number of undergraduate students to act as assistants in the clinics of the Infirmary. This privilege permits a student to obtain unusual clinical advantages in the various departments of the institution where Operative Dentistry, Orthodontia, Nose and Throat, Oral Surgery, Radiography, Pathological Diagnosis and Research Work are continually carried on.

Operators' gowns and all instruments are furnished. Over three hundred children are treated daily.

For further details apply before May 15th to the Director, Dr. Harold DeW. Cross, 140 The Fenway, Boston.

FIRST UNIVERSITY DENTAL SCHOOL IN NEW YORK FOR COLUMBIA.

Dental Course to Be Allied with College of Physicians and Surgeons.

Realizing the importance of the teeth and mouth infections to systemic disease, the Faculty of the College of Physicians and Surgeons have unanimously voted in favor of the establishment of a dental department, to be connected with the medical school. A committee of prominent dentists of the city have presented plans to the medical faculty which have been approved.

The school of dentistry will be closely associated with the medical school and the admission requirements will be the same as the medical. The course will be four years, the first two years the same as those in medicine, thus giving the dental student a thorough knowledge of the fundamental sciences necessary to the practice of a specialty of medicine. At the end of the second year the dental student will give all his time to the study of dental subjects, namely, operative dentistry, prosthetic dentistry, oral surgery and oral pathology, orthodontia, etc., and the more technical part of the work required for the well trained dental surgeon. This new school will be the first university dental school in New York City and the second in the State. It will give the first four year course of dentistry ever given in the Empire State.

SOME GOLD BONDS.

May yield an income of 5½% on your investment, but there is *no* limit to the benefit which will accrue if you invest in a trip to Louisville, Ky., and attend the great convention of the *National Dental Association,* July 25, 26, 27, 28, 1916.

The first yield on your investment will be in the nature of a vacation and from experience you know that is a paying proposition.

The second yield will come from what you are sure to learn from the splendid clinics and papers.

The third yield will come from meeting some of the boys you have not seen in years.

The fourth yield will be derived from a day spent in Louisville's unequaled Armory on whose 54,000 square feet of floor space will be staged the most stupendous exhibit ever conceived in sixty horse-power minds of the American Dental Manufacturers. There are countless benefits which will come to you; we are merely suggesting a few.

Don't miss the one best bet of your life. Buy your bond now by joining your local society. You will cut off your coupons in Louisville, Kentucky, next July.

YOU'LL FEEL AT HOME IN LOUISVILLE.

CONNECTICUT STATE DENTAL ASSOCIATION.

The Fifty-second annual meeting of the Connecticut State Dental Association will be held this year at the Hotel Griswold, New London, Connecticut, the dates being June the thirteenth, fourteenth and fifteenth, nineteen hundred and sixteen.

In conjunction with this meeting, the second annual meeting of the Connecticut Dental Hygienists' Association will be held.

Every effort is being made by the committees in charge to make this the most successful meeting in our history. Distinguished members of the profession have been secured to give interesting papers and clinics.

A banquet will be given one evening during the convention, for which no additional charge will be made.

Reservations should be made in advance, by addressing H. D. Saxton, Manager, 305 Fifth Avenue, New York City.

Those attending will be assured of a most delightful time. A part of one day has been set aside for recreation and sports, which includes tennis, bathing and golf. The Shennecossett Golf Links, within walking distance of the hotel, will be at the disposal of the members, and will be found one of the finest in the country. You are earnestly requested to bring the ladies, who will enjoy special entertainments arranged for their pleasure.

A cordial invitation is extended to all ethical members of the profession. Remember the time and place. A. V. Prentis, President. Elwyn R. Bryant, Secretary.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN.

140 The Fenway, Boston, Mass.

PERMANENT STAFF APPOINTMENTS.

An examination of graduates in dentistry (of less than three years standing), for appointments to positions on the permanent staff for full and one-half time service will be held early in June at the Infirmary.

Appointments will be made for one or two years as follows:

Full time service requiring every day, 8 hours per day, with one afternoon off a week, at a salary of $1,000 per year.

One-half time service requiring 3½ hours per day either forenoon or afternoon, at a salary of $400 per year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry from different parts of the world, in addition to the numerous regular clinics and lectures.

The operators on this staff have the advantage of the clinics and lectures of the Post Graduate School of Orthodontia.

All material and necessary operating instruments will be furnished; up-to-date apparatus including electric engines, sterile instrument trays, fountain cuspidors, compressed air and modern-operating-room-type lavatories are available for use.

A diploma of service will be issued to each member of this staff who has completed this term to the satisfaction of the Trustees.

Applications for the above positions should be made not later than May 15th. Information will be gladly furnished to anyone interested, also the date of the examination.

Harold DeW. Cross, D.M.D., Director, 140 The Fenway, Boston, Mass.

AMERICAN RELIEF CLEARING HOUSE.

(COMITE CENTRAL DES SECOURS AMERICAINS.)

5, Rue Francois, 1er
Paris, March 13th, 1916.

Mr. Whitney Warren,
16 East 47th Street,
New York.

My dear Warren:

Many thanks for the literature on the organization of the Physicians', Surgeons' and Dentists' Fund. It is an excellent idea and ought to do a great deal of good.

In this connection I have just had a long talk with Melle Javal, who is very anxious to get dental instruments. In her work for the eclopes she has become very familiar with this necessity and according to her account the conditions are pretty bad. She estimates that there are about 80,000 men whose mouths need serious treatment, due to the inability of the soldiers in the trenches to give proper care to their teeth. The instruments which the Service de Sante is able to send out are either improper or insufficient in quantity. Such a thing as a full set of forceps is not known and operations have frequently to be done with instruments wholly unsuitable to the purpose. The dental branch of the new fund might be interested in taking this matter up.

By first available mail I shall try to send you a list of instruments for which need is felt in the hope that perhaps a kit may be suggested and made up to be placed with different military units.

With affectionate regards, I am,

Faithfully yours,

(Signed) H. C. Beatty,
Director General.

PATENTS RELATING TO DENTISTRY.

1119407. Anchor for teeth-fillings, Joseph V. Davis, Concord, N. C.
1119373. Dental appliance, Eliza R. Stealy, Shenandoah, Iowa.
1119943. Anchor post and brace, Louis E. Fontaine, Levis, Quebec, Can.
1120314. Attachment for dental machines, Wm. H. King, Blacksville, W. Va.
1119885. Casting apparatus for dental castings, Heinrich Schweitzer, New York, N. Y.
1120704. Tooth, Leo E. Evslin, New York, N. Y.
1120705. Tooth, Leo E. Evslin, New York, N. Y.
1121082. Handle for tooth brushes, Walter T. Farrar, Louisville, Ky.
1121252. Device for sharpening dental sticks, etc., James W. Ivory, Philadelphia, Pa.
1121016. Means for forming tooth crowns, Fernando O. Jaques, Jr., Cranston, R. I.
1122086. Combined mouth prop and illuminator, Wm. F. Dunlop, New York, N. Y.
1121934. Bur-block, Frederick W. Miller, Toledo, Ohio.
1121669. Spoon attachment for dental syringes, Thomas W. Russell, Minneapolis, Minn.
1122868. Collapsible tube, John B. Davis, Lansdowne, Pa.
1122869. Means for controlling discharge of material from collapsible tubes, John B. Davis, Lansdowne, Pa.
1122881. Tooth brush holder and sterilizer, Ernest C. Dye, Greenville, S. C.
1122718. Backing plate for artificial teeth, Gustav E. Fritz, Peoria, Ill.
1122979. Means for attaching an artificial tooth to a bridge, Hugh D. Morgan, Youngstown, Ohio.
1124099. Dental casting apparatus, Wm. A. Adams, Detroit, Mich.
1123830. Dental cabinet, Erie Zincke and C. H. Bull, Bucyrus, Ohio.
1124299. Dental saliva tube, Albert B. Cosad and C. F. Wise, Oakland, Cal.
1124728. Dental broach cutting machine, James F. Hardy, New York, N. Y.
1124498. Dental inlay holder, Charles W. Millar, Carnegie, Pa.
1125582. Tooth-brush, Earl Himmel, Iowa Falls, Iowa.
1125559. Blowpipe, Aage Kofod, Zurich, Switzerland.
1125576. Dental tool, Morton Maier, New York, N. Y.
1125168. Dental tool, Frank E. Perkins, High Point, N. C.
1125933. Holder for toothpicks and other sticklike devices, Thomas and C. M. Bartholomew, Columbus, Ohio.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

ANNOUNCEMENT.

FIFTY-SECOND ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

To be held at Springfield, Ill., May 9-10-11-12, 1916.

In presenting the program for the coming meeting of the society the committee desires to state that an effort has been made to offer subjects of great present interest and importance to every progressive member of the dental profession.

The men who will present these papers need no introduction to the Illinois State Society, and no member can afford to miss the opportunity to become conversant with the latest findings of their study and experience.

We feel confident that every dentist who will attend this meeting will be amply repaid for doing so, and to further exhort you to be present and make this meeting a great success seems unnecessary.

The Honorable Edward F. Dunne, Governor of the State of Illinois, has accepted the invitation of the committee to be present and make an address of welcome to the society at the opening of the meeting.

Robert J. Cruise,
Program Committee.

PROGRAM.

(1). Invocation—Rev. W. J. Johnson, of Springfield.

(2). Address of Welcome—His Excellency, Edward F. Dunne, Governor of the State of Illinois.

(3). Address of Welcome—Honorable Chas. T. Bauman, Mayor of Springfield.

(4). Response to the Addresses of Welcome in Behalf of the Society—J. M. Barcus, Carlinville.

(5). The Annual Address to the Society by the President—J. P. Buckley, Chicago.

(6). Discussion of the President's Address—Donald M. Gallie, Chicago.

(7). Report of the Committee on Dental Art and Invention—P. A. Pyper, Pontiac.

(8). Report of the Committee on Necrology—C. M. Cahill, Chicago.

(9) Report of the Committee on Legislation—C. R. E. Koch, Chicago.

(10). Report of the Public Service Commission—H. F. Lotz, Joliet.

(11). Report of the Committee on Dental Science and Literature. Presented as an Essay—P. G. Puterbaugh, Chicago. Discussion opened by M. R. Harned, Rockford; J. P. Luthringer, Peoria.

(12). Chronic Infections Associated with the Root Ends of Teeth. Illustrated by stereopticon—W. H. G. Logan, Chicago. Discussion opened by C. N. Johnson, Chicago; W. A. Young, M. D., Springfield; G. D. Sitherwood, Bloomington.

(13). The Present Trend of Operative Dentistry—J. V. Conzett, Dubuque, Iowa. Discussion opened by H. J. Goslee, Chicago; LeRoy Snowden, Peoria; A. D. Black, Chicago.

(14). The Case of the Individual—Arthur G. Smith, Peoria. Discussion opened by E. K. Blair, Waverly; Edmund Noyes, Chicago; J. F. F. Waltz, Decatur.

(15). Root Canal Preparation, and Filling. Illustrated by stereopticon—E. D. Coolidge, Chicago. Discussion opened by D. C. McCann, Danville; F. W. Gethro, Chicago; M. L. Hanaford, Rockford.

(16). The Treatment of Children's Teeth—L. B. Torrence, Chester. Discussion opened by Grafton Munroe, Springfield; T. L. Grisamore, Chicago; M. D. K. Bremner, Chicago.

(17). Conductive Anesthesia—H. A. Potts, Chicago. Discussion opened by A. E. Smith, Chicago; E. F. Hazell, Springfield; F. B. Moorehead, Chicago.

(18). Administration of the Dental Laws of Illinois—O. H. Siefert, Springfield. Discussion opened by J. G. Reid, Chicago; W. F. Whalen, Peoria; L. L. Davis, Chicago.

(19). The Present Trend of Crown and Bridge Work—J. H. Prothero, Chicago. Discussion opened by C. J. Sowle, Rockford; C. B. Brownell, Peoria; J. D. White, St. Louis, Mo.

OBITUARY.

ROLLIN BREED TULLER, D. D. S.

Born—Cincinnatus, N. Y., June 29th, 1845.
Died—Chicago, Illinois, March 20th, 1916.

Served as principal musician of 136th Regiment, N. Y. Volunteer Infantry nearly three years during war of the Rebellion. Attended Pennsylvania Dental College 1875-6 and 1878-9. Had to leave second term early on account of illness of his wife, which prevented his graduation at that time. Practiced in Rouen, France, in 1883-4. Graduated in class of 1900 at Chicago College of Dental Surgery, afterwards serving as member of the faculty for 10 years. Was a member of the National Dental Association, Illinois State Dental Society, Chicago Odontographic Society, of which he was president in 1893, Northern Illinois Dental Society, Delta Sigma Delta Fraternity, in which he served two successive years as the Supreme Grand Master. Formerly editor of American Dental Journal and for many years associate editor of The Bur. Member of St. Cecilia Lodge 865 A. F. and A. M. and Columbia Post G. A. R., who conducted the burial services in Rosehill cemetery. The active pall bearers were *Past Supreme Grand Masters* D. C. Bacon, F. H. Zinn, C. E. Meerhoff, Geo. N. West and C. E. Jones, and the present Supreme Grand Master D. M. Gallie of the Delta Sigma Delta Fraternity. Dr. Tuller leaves a widow and two sons, Dr. Charles S. Tuller of New Orleans and Rollin M. Tuller. G. N. W.

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THE
DENTAL REVIEW.
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PRESIDENT'S ADDRESS.*

BY J. P. BUCKLEY, PH. D., D. D. S., CHICAGO, ILL.

Members of the Illinois State Dental Society; Ladies and Gentlemen:

Another year has passed and we have assembled again to make the history of the fifty-second annual meeting of this Society. What a glorious privilege it is to make these annual pilgrimages to the various cities of our state and hold these meetings! Here it is that we meet on a common level and discuss the mutual problems of the day. It is to a consideration of some of these problems that I wish to direct your attention in this message.

Before doing so, however, I want to take advantage of this opportunity and thank the members of the Society for the great honor they conferred upon, and the confidence they reposed in me at the closing session last year in electing me president. This is an honor which every member must covet; but which, in the natural order of things, can only come to a limited few. Therefore, it should be the more fully appreciated by those who are fortunate enough to receive it.

No man, or group of men, can make a success of the meetings of a society as large as the Illinois State Dental Society has grown to be without the hearty co-operation of every member. This co-operation your present officers have had; and I am certain that both our Literary and Clinical Program will prove to be of the greatest interest. And right here I want to thank Doctor R. J. Cruise of the Program Committee; Doctor C. F. B. Stowell, and his co-workers, of the Clinic Committee; Doctors O. L. Frazee and J. E. Darmer, and their co-workers, of the Local Committee of Arrangements and Exhibit Committee, respectively; the Ad Interim

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*Read before the Illinois State Dental Society, May, 1916.

Committee; the members of the Council; and all other Officers and Committeemen who have worked hard for the success of this meeting. Last, but by no means least, do I want to especially thank our Secretary, Doctor Henry L. Whipple, for his valuable and efficient services. With a Secretary such as Doctor Whipple the work of the President is minimized.

With this prelude let us turn our attention to some of the problems of the present time. To-day the eyes of the world are focused upon dentistry. Never before in the history of our profession has there been so much expected of dentists and of dentistry as there is at the present time; and the redeeming feature of it all is that dentists are shouldering their responsibility and are equipping themselves to meet the demand. This is evidenced on every hand. Study clubs are organized all over the country, and post-graduate work is being taken up by many State Societies.

TRI-STATE MEETING OF KANSAS, OKLAHOMA AND MISSOURI.

On March 20th to 26th there was held at Kansas City, the Tri-State Meeting of Kansas, Oklahoma and Missouri. This meeting was conducted along the line of a Post-Graduate Course, such as we started in Oklahoma four years ago. The idea has been adopted by several other State Societies. It has been my privilege to have been associated as a teacher with four such meetings, and from my personal observation and experience I feel that this Society would do well to consider seriously adopting such a course for our next meeting. This is not a recommendation; but a suggestion which I trust will be given due consideration.

This Tri-State Meeting was, without doubt, the greatest meeting of its kind that was ever held. Over one thousand men came from eighteen different states, paid $5.00 in addition to their regular dues, and they stayed for the entire meeting, which began Monday morning and closed Saturday afternoon. The interest manifested in every lecture indicated that the profession is truly alert to their responsibility. These men were simply hungry for the truth. Time will not permit me to discuss this meeting further now; but I shall refer to certain specific instances relating to it later on.

PULPLESS TEETH.

One of the greatest problems, if not the greatest, confronting our profession to-day resolves itself into the question, What shall be done with pulpless teeth? This problem has been solved; the question has been answered by Doctor M. L. Rhein, Doctor Elmer S. Best and others; and, fortunately for all concerned, the answer does not contain the statement that in order to conserve the general health of the patient, these teeth must be extracted. Methods and means of treating pulpless teeth, preparing the canals for filling and the technic of filling the same, have been improved; the necessary surgery in the successful management of such cases has been emphasized; and the results, by radiographic findings, have been shown to be perfect from the standpoint of health, comfort and service. At this Tri-State meeting Doctor Rhein proved conclusively the fallacy of extracting teeth simply because the pulps had been removed. He showed case after case of bone regeneration after the treatment of a dental granulōma or alveolar abscess.

But in considering this vital question, let us be fair to all concerned, and not endeavor to shift our responsibility. You know and I know that in the past many hopelessly diseased teeth have been retained in the mouth in utter disregard to the possible deleterious effects they may have on the general health. This will not be the dentistry of the future. In the past neither physicians nor dentists knew of the systemic effects of focal infection. That classic, though at the time, much criticised, article of Sir William Hunter started both the professions of medicine and dentistry thinking seriously along this line; and today we have a better understanding of what focal infection means, whether the focus is about the teeth, the tonsils or the toes. The profession of medicine is safe with its Hunter, Murphy, Crile, Mayos, Billings, Rosenow, and others. Likewise our own profession will not go far astray with men like Price, Hartzell, Rhein, Grieves, Brophy, Gilmer, Logan, Moorehead, Black, Callahan, Best, Coolidge, Biddle, and a score of others whose names could be mentioned in connection with this work. Our profession from to-day on will not countenance nor tolerate the slipshod methods of root-canal work that has characterized the past. We can no longer plead ignorance; our eyes have been opened. From now on we will treat and fill the canals of teeth after the methods of the men who know—not after the methods advocated by the manufacturers of so-called quick and sure "abscess cures," with their glaring catch phrase "permanently antiseptic." Personally, I have been too busy in life to have trained myself to see the clouds; but I frankly admit that at times I have felt somewhat discouraged with the effort I have endeavored to make to place the treatment of pulpless teeth on a rational and scientific basis. Too many men—good, conscientious men in other respects, have followed the "easy way" in root-canal work, and have listened to the siren call of those who have deceived and mislead for personal aggrandizement. The X-ray is as valuable to dentistry as it is to medicine; and by this means we have been shown the dire results of our own folly in handling pulpless teeth. But I have never been accused of being a pessimist. Today I am happy to say that I can stand back where I can see above and beyond the clouds; where I observe the radiant sunshine, with its stimulating rays and its elevating influence; and from this vantage-point, I see the dental Journals of the future making their advertising pages as free from questionable root-canal filling materials, and other fake and questionable ads, as are the pages of the *Journal of the American Medical Association,* or our own *Journal of the National Dental Association.*

COMMERCIALISM.

Any profession or business, in its upward or downward progress, naturally drifts along certain definite lines; and those who have watched closely the progress of dentistry must admit that in the past—not necessarily the recent past, but in the past, there has been and is a tendency toward commercialism. Has this tendency been detrimental to the progress of dentistry, or is it more in evidence today than it has been in the past? These are questions which it is but right and proper to consider. Therefore, let us discuss frankly, here in the open, this problem of commercialism; for a problem it certainly is, and one, which when settled, must be settled along broad and equitable lines. Some one has said, "No question is ever settled until it is settled right." There is just a little manifested tendency on the part of some ultra-conservative members of our profession to criticise other members for what is termed "commercial tendencies." Unless explained this term means nothing, but it is one that is frequently used. If we read the history of dentistry as recorded by our historians today, we learn of many men who spent their time, money, energy, and their lives working on some problem, the solution of which was of inestimable value to their profession, and, in many instances, to humanity. Many of these men were so absorbed in their work that they neglected their practice; and when they reached the sunset of life and were incapacitated for work, they found themselves dependent upon the charity of friends. We need not go beyond the membership of our own society to find striking examples of such lives. With these examples before them, other men who have worked equally as hard and in some instances have been able to accomplish more, have felt it a duty incumbent upon them to provide, as they went along, the necessities of life. They, therefore, above board and in an honest and ethical way, have offered "for sale" in one way or another the product of their brain. I repeat that there has been and is just a little manifested tendency on the part of some to criticise or cast insinuating remarks regarding this class of investigators. This is due more to a misunderstanding of the motives which actuated the course, than to anything else.

That I may be more clearly understood, let me say that I have in mind two great men with productive minds, both members of this society—one living and one dead. Their names are known wherever good dentistry is known. Let us review briefly their work.

Several years ago there was a man in Chicago who was a pioneer in inlay work. He began making inlays by one method or another when others seriously and openly questioned his judgment. He was a man, who, like Tennyson, "dipped into the future far as human eyes could see, and saw," so far as the inlay at least was concerned, "the visions of the world, and all of the wonders that were to be." However, he was a thoroughly practical dentist and, inlay enthusiast that he was, he recognized its weak points, and felt that in order for the inlay to be accepted as routine and general practice, we must have better cements. He, therefore, turned his attention to the making of better and more reliable cements. This took time and money, and to accomplish his purpose, he felt it necessary to give up a lucrative practice and offer his product "for sale." To-day he is recognized as one of our best and most reliable cement manufacturers. Who would dare say that dentistry has not been markedly advanced by the researches of our own Doctor W. V.-B. Ames; and is it just to accuse him of being commercial? But perhaps you will say Doctor Ames quit dentistry and entered the commercial field. Is this necessary?

There was a time when one broach practically had the endorsement of the entire profession. Everyone felt that they must use this broach, though an expensive one. A member of our society went to work and made or had made a broach for one-half the price, that was equal in every respect to the former popular broach. This experience led this man into the manufacture of burs, and dental amalgam alloys, and cements, and into the dental supply business—to the end that today we are buying these materials better and cheaper than they no doubt would be, had it not been for our late and highly respected, Doctor J. N. Crouse. Doctor Crouse did not give up his practice, and no one can justly accuse him of being commercial. The work which he did for dentistry, in more ways than one, will stand as a monument to his memory.

This question, like all real questions, has another side. I will simply refer to it briefly. There is a kind of commercial tendency manifested in our profession today which certainly must be discouraged or checked. It is that to which Doctor Otto U. King referred in an editorial in the *Bulletin* of the Indiana State Dental Society some months ago, as was evidenced at the clinics of the Panama-Pacific Dental Congress; it is that to which Doctor C. N. Johnson more recently referred editorially in the April DENTAL REVIEW. It is that tendency—yes, more than a tendency, that deliberate "exploiting the people" by calling nitrous oxid and oxygen—"twilight sleep," a porcelain jacket crown "reenameling," the diagnosing in all mouths a condition of pyorrhea, and the offering of a sure and permanent cure by new, original and seclusive methods. I refer to that group of men who have nothing to offer of real value; those who claim to have a remedy, an article or a method of superior value, known only to them and their Creator, which when tested proves to be fictitious. What the profession must learn is that which is needed in every walk of life—the art of discrimination. Some day written rules must be established or a standard given which must govern men in these matters. When these rules or standards are formulated they must be just and equitable; and the sooner they are established and the line sharply drawn, the better it will be for all concerned. My plea is to check or curb the commercial tendencies of the pirate and the charlatan who prey upon the profession and the laity; but I also urge the importance of offering some encouragement to the man who can do more for dentistry in the field of investigation than he can by sticking closely to his practice.

NATIONAL RELIEF FUND.

Some years ago, at the suggestion of Doctor L. G. Noel, of Nashville, Tennessee, the National Dental Association started a Relief Fund for indigent members of the profession. There is in this fund at the present time about $12,000.00. The greater portion of this money has been raised by the sale of Christmas Seals. It is the plan of the committee having the work in charge, of which committee Doctor E. S. Gaylord, is Chairman, to raise $50,000.00 before any money is expended. This will make a permanent endowment from which the interest only shall be used for relief purposes. What I desire to emphasize in connection with this worthy cause, is the fact that the Relief Committee for 1916 has ordered two million seals. Every member of the National Dental Association and every friend of the cause will be supplied with a dollar package of these Christmas Seals on about the 10th of December. In this manner the Committee expects to raise at least $12,000.00, from the sale of these seals alone. These seals will come at the time when our minds and hearts are turned toward giving to others and rendering some service to humanity. Therefore, I ask you when the seals are received to send your check for $1.00 to the General Secretary of the National Dental Association instead of returning the seals.

ARMY AND NAVY LEGISLATION.

Every member of our profession must be interested in the effort that has been made by the Legislative Committee of the National Dental Association to have included, in the General Defense Bill before Congress, proper recognition of the members of our profession, who are serving in the Army and Navy. As this matter was thoroughly discussed by Doctor Homer C. Brown, the Chairman of the Committee, and by Doctor Otto U. King in two editorials in the last issue of the *Journal of the National Dental Association;* and as Doctor Koch, who is a member of the Committee, will doubtless refer to it in his report, I will not discuss it further here, except to say that it is the duty of every dentist to familiarize himself with the status of the dental surgeon in the Army and Navy.

RESEARCH INSTITUTE OF THE N. D. A.

Acting under the authority vested in them at the Kansas City meeting of the National Dental Association, the Trustees of the Foundation and Research Commission proceeded to incorporate under the laws of whichever State proved to be the most favorable to institutions of its kind. After much investigation Ohio was selected as the State whose laws were the most favorable, and accordingly a charter was secured. At a meeting of the Trustees of the Foundation and Research Commission of the National Dental Association, held at Cleveland, Ohio, on September 25th, 1915, the name was changed to the "Research Institute of the National Dental Association," and a formal transfer of the properties, etc., was made to the newly chartered institution. There has been just a little misapprehension on the part of some regarding the status and policy of the Research Institute. Some have expressed an opinion that the Institute was gradually slipping away from the control of the National Dental Association. There is absolutely no foundation in fact for any such opinion. Under the charter the members of the Foundation and Research Commission become "commission members" of the Research Institute, and other men are added who are known as "permanent members." The latter are men of distinction in the United States, and are not dentists. These two classes of members constitute the body of the Research Institute and they elect the Trustees who run and control the business affairs of the institution. It should be remembered, however, that the Constitution provides that of the Board of Trustees, five shall be elected from the Research Commission of the National Dental Association, thus giving Dental members a majority on the Board. Unless the charter is changed, and it can only be changed by the Board of Trustees, it will never be possible to take the Institute from under the control of the National Dental Association. The laws of Ohio provide that a majority of the members of the Board be residents of the State, and further that each member of the Board shall be individually responsible for the debts of the institution.

For many reasons it seemed best for the Research Institute to own a building, and when an opportunity came to purchase a building for $50,000.00 which cost originally to construct $75,000.00 and which was located on ground worth $45,000.00, the Board of

Trustees grasped the opportunity and purchased the property. The owner became interested in the work and donated $2,000.00 on the purchase price, leaving the net cost of the Institute $48,000.00, or only $3,000.00 more than the actual value of the ground. No one can begin to realize, unless they have been with the man on many occasions as I have been the past year, what a load Doctor Weston A. Price, the President of the Research Institute, is carrying. He must be relieved of a part of his responsibility as soon as possible. Besides all he is doing to raise the funds to carry on the work of the Institute, under protest he accepted the managing directorship. Doctor Price is doing all of this work without one cent remuneration. It is not right to ask him to carry this overload much longer. Sufficient funds must be provided to pay for the building and hire a managing director who is capable of taking full charge of the work.

It is the purpose of the Commission and Trustees of the Institute to continue researches by grants to men in different parts of the country as they are doing at present; and they also feel it essential to establish in the Institute at Cleveland certain definite researches. If the building were paid for it would not only stop the interest, but it would aid materially in securing endowments for the Institute. The Trustees are making a vigorous campaign to provide for the payment of the building, if possible, by the time the National Association meets at Louisville; and they intend doing it without disturbing the contributions to the Research Fund proper. Not one cent of the money that was contributed for research work has been used in the purchase of the building or its furnishings. On April 3rd, $22,371.89 had been subscribed from various sources for the building fund. The bulk of this amount had been paid by the Trustees of the Institute, each of whom gave $500.00, and the dental profession of Ohio. The Ohio State Dental Society gave $4,000.00 from its funds to be applied on the purchase of the building. The Cleveland dentists have given $5,000.00 and the citizens of Cleveland have subscribed quite liberally. It is also gratifying to mention that individual dentists from all over the country have sent money to be added to the building fund. At the recent Kansas City meeting, heretofore referred to, Doctor Price gave a series of lectures covering certain phases of the work which he and his associates are doing at the Institute. After one of the lectures an opportunity was given for those present to subscribe to the two funds—the research fund and the building fund. In a short time there was subscribed $6,755.00, with more in sight. The amount was divided between the two funds, about three-fourths for the research and one-fourth for the building fund.

Last year our members made a liberal contribution to the research fund; but this amount came from a few, comparatively speaking. There are far too many members of our society who have not contributed, and who would gladly do so if they knew more regarding the character of the work that is being done by the various researches, and if they could only realize the importance today of such investigation. I hope to see a liberal contribution made at this meeting. Our duty is plain: We should either take an amount of money equal to $1.00 per capita for our membership from our treasury, or raise it by private subscription. This is your problem and I leave it to you to settle. I am willing to help. In the Research Institute of the National Dental Association, we have one of the grandest institutions in the world, started by dentists for the advancement of their profession and for the benefit of humanity; and as Doctor Thomas P. Hinman, the President of the National Dental Association, has said, "now is the time for us all to bid it God's speed, and help with our means in proportion to what God has blessed us."

ENDOWED DENTAL INSTITUTIONS.

Not many years ago a rich man of Boston, while sitting in a dentist's chair, casually remarked that he was thinking of perpetuating his family name by endowing some kind of an institution; but that he was at a loss to know for what purpose the memorial should be founded. The dentist at once asked if he had ever thought of the thousands of poor children in the city who were unable to have their teeth properly cared for, and if he realized the amount of suffering thereby entailed. This remark of Doctor Irvin A. Johnson set Mr. James Forsyth to thinking with the result that today the city of Boston, and the dental profession of the United States and of the world are proud of the $2,000,000.00 "Forsyth Dental Infirmary for Children." All that is necessary for a child to be admitted to the clinic of this Institution is to present an application card, properly filled out, bearing the signature of the parent or guardian, authorizing the admission of the child for treatment. Up to sixteen years of age, any child is eligible regardless of race, color or creed, providing they come from families who are financially unable to pay for the services of a private dentist. From the annual report, just published, we learn that the total registration of patients for the year 1915 was 19,930. They have twenty-four full-time and twenty-eight half-time operators. The total operations for the year in the "operative clinic" alone were 128,404. Thus we can the more fully appreciate what this Memorial to the four Forsyth Brothers is doing for the comfort, the health and the happiness of the poor children of Boston. It stands as a monument to these sturdy brothers, and says to the world:

"To all our children everywhere,
Let us be just, be kind, be fair."

At the present time there is being built in the city of Rochester, New York, an Institution to be known as the "Rochester Dental Infirmary." It is founded by Mr. George Eastman, and will cost when completed about $300,000.00. The equipment is expected to cost about $75,000.00. Mr. Eastman and the Trustees have succeeded in obtaining Dr. Harvey J. Burkhart, of Batavia, New York, to act in the capacity of Director of the Institution. Doctor Burkhart is recognized as a leader and an executive of rare ability, and it is fortunate for all concerned that the services of such a man were obtained. It is said that Rochester is the first city in the world to establish a free dental clinic for the worthy poor; it is therefore, fitting and proper that the city should have such an institution as this.

Within the past year the Evans Dental Institute and Museum was opened at Philadelphia. This institution was richly endowed by the late Doctor Thomas W. Evans for educational purposes. Its policy differs, therefore, from the Forsyth and Eastman Infirmaries. It is thus briefly mentioned here because it is an endowed dental Institution.

MEMORIAL TO DOCTOR G. V. BLACK.

During the meeting of the Ohio State Dental Society last December there was unveiled at Columbus, a statue of the late Doctor W. D. Miller. This is a deserving tribute to a great man. It is not my intention in this address to discuss matters which are to be reported at this meeting by the different committeemen; but I am certain that the Chairman of the Committee on Necrology will pardon my brief reference here to the death of one of our most distinguished members.

Those of us who were in attendance at the Panama-Pacific Dental Congress were deeply grieved to hear of the death of Doctor G. V. Black. The announcement came just as the Congress had opened, and one could easily discern the cloud which spread over that vast audience. In matters pertaining to dentistry Doctor Black was easily the master. No words of mine can add to the beautiful sentiments that have been expressed by surviving friends. If the world misses him, as it surely does, how much more will we miss him. It was our pleasure and privilege to live with him, speak to him, and feel free to consult him at any and all times. The Illinois State Dental Society has lost one of its most cherished members; the world has lost a benefactor. All that is needed to erect a monument to his memory, as was done in the case of Doctor W. D. Miller, is for some one to say the word. Let the word come first from the members of this society for whom he did the most. Other things I have only suggested; this I urgently recommend.

Thus far in this address my plea has been for a bigger, broader, better dentist. May I now leave dentistry for a moment and close by making a plea for a bigger, broader, better citizen. We are living today in one of the most turbulent times that have ever been recorded in the world's history. Since his incumbency the President of the United States has been dealing with grave problems. No preceding President has been confronted with a greater crisis than that which has been staring President Wilson in the face. And, yet, my friends, notwithstanding all this, we find too many citizens who are so narrow and constricted that, without the facts, they are ever ready to criticise Congress and the President. I am not here to say that President Wilson has made no mistakes; but I do wish to say that he has done remarkably well under the conditions; and that, whether or not we agree with him in his political faith, this is the time when every citizen, regardless of his political affiliations, should be loyal to his country and stand back of our President. The eyes of all nations today are turned toward the United States; and their future actions will be governed largely by their interpretation of the feeling among our citizens.

In 1898 we sat by our fire-sides enjoying the comforts of our American homes and the privileges of our American liberty, endeavoring to close our eyes and ears to the moans and groans that came from the Island of Cuba. Most of you remember and so do I how we tried not to hear those expressions of agony coming from a people suffering under a despotism equal to, if not greater than any ever recorded in ancient history. Then, as now, there were newspapers and men in both public and private life criticizing President McKinley for not declaring war; no one was more vituperous than that well-meaning, but hot-headed little Senator from Illinois, William E. Mason, who unwittingly dug his political grave as many public men are unwittingly doing today. President McKinley knew better than Senator Mason seemed to know that, at that time, we scarcely had enough available powder to blow up one Spanish ship; and so he justly was cautious. McKinley hesitated until we could get somewhat better prepared; until he saw that our American Institutions were not respected; until he thought, by the explosion of the Maine, that the lives of our American sailors were being sacrificed; yes, until he realized that the "old flag" was being insulted; then he no longer hesitated, but called upon Congress to declare war with Spain. Then it was that there assembled for service the white man and the black man; the old slave and his former master; and on the hills of El Cana and San Juan they fought side by side, those who had worn the blue and those who had worn the gray, when the sun was so hot they could scarcely hold their rifle barrels; but on they went until they had torn down the Spanish flag—never again to be hoisted on the Western hemisphere, and hauled up the "stars and stripes," the emblem of liberty. And there amid the dust and heat and blood and tears, of that day's battle, melted away forever the hatred and the animosity that had separated the people of the North and the South. One of the first American soldiers to lose his life in the Spanish-American war was a boy from a millionaire home on Broadway, New York City; and as he fell, to his left there stood a cowboy from the West, and on his right, a plowboy from the South.

I want to close my address with a plea for a bigger, broader, better citizenship. These are the times when we should harmonize our differences and be loyal to our profession and loyal to our country. If you care to change Presidents another year, that is your privilege as an American citizen; but now is the time to stand back of the President we have. Let us foster the spirit of brotherly love, and spread the gospel of truth. Let us see to it that the principles of citizenship and patriotism are preached more fervently from our pulpits; taught more earnestly in our schools; and practiced more faithfully in our homes. Then, my friends, we will have reached the time on earth to which Kipling referred when he said:

> "And only the Master shall praise us,
> And only the Master shall blame,
> And no one shall work for money,
> And no one shall work for fame:
> But each for the joy of working,
> And each, in his separate star,
> Shall draw the Thing as he sees it,
> For the God of Things as they are."

PREVENTIVE DENTISTRY.

An Answer to the Present Dental Dilemmas.*

BY DR. W. A. CHAMBERLAIN, ST. LOUIS, MO.

Is there any more fitting answer to the present day dental dilemmas than Preventive Dentistry? Consider the conflicting theories of the different branches of dentistry, which according to the present day authorities create difficult problems, which any dentist who is prompted by a desire to render honest service of the highest type, would be glad to avoid.

ROOT CANALS.

Was there anyone who heard Dr. Best who did not feel impelled to avoid all the root canal work possible, and to make an unusual effort to save the pulp rather than devitalize? Who would not now inflict a little more pain on the patient, and possibly wear on himself with the stress of the painful operation, rather than undertake the difficult, and in some cases impossible, root canal work?

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* Read before the St. Louis Dental Society, April 4, 1916.

Root canal work, the latest sensation in dentistry, and possibly indirectly so in medicine, by way of focal injection, has, to my mind, created many dilemmas. There was a time not long ago when I felt that all the methods of dental practice had been standardized, but now periapical conditions resulting in alarming general systemic conditions, have complicated most all branches of dentistry.

Reading an article by Dr. Raper along these same lines, he quotes Dr. Carr who says, "That if you do not do proper root canal work, the patient has heart disease, and if you do, the patient has heart disease when he gets the bill."

The root canal experts claim that there are a certain percent. of teeth which, on account of their abnormal anatomy cannot be properly filled, and that these teeth should be extracted regardless of other dental laws. These teeth may be any from the incisors to the third molar and because of the very serious and vital consequences that are possible, resulting from the unfilled portion, which serves as a focus of infection, it is advocated to extract at once.

Of those remaining, which by use of X-Ray are found to be of such development as to permit of proper treatment and filling, there are several dilemmas created in the matter of devitalization in the vital teeth, and in the treatment of those in a putrescent condition.

DEVITALIZATION.

Arsenic, the most generally used devitalizing agent, and I should say satisfactory to the patient as well as to dentist, because of the ease of making the application, is no longer indicated. We are now informed that arsenic is so powerful and penetrative, that it attacks the periapical tissue, lowering its vitality so that it is susceptible to infection through the blood stream, even though perfect canal work has been done under aseptic conditions.

If arsenic is not used, we are confronted by the difficult conditions in accomplishing pressure anesthesia. Many cavities are located where the access is so difficult as to preclude this method. A more accessible cavity could be drilled, but that seems like unnecessarily mutilating the teeth. Then there are conditions of the pulp where to use pressure anesthesia would mean to force the bacteria of the cavity, or bacteria and bacterial toxins which may exist in a still partially vital pulp into the periapical tissue. This is not desirable of course and may be followed by complications.

Conductive anesthesia eliminates most of us, because of the skill and technique required. Furthermore, it is the opinion that very few patients would submit to it. Infiltration may be used with more or less success, and more or less pain.

General anesthetics may be used, such as nitrous oxid, and are very successful in single rooted teeth, but in posteriors experience has taught that it is not well to try them.

Of the two methods to choose between, pressure and general anesthesia, neither is successful in all cases, and both may be possible in some.

TREATMENT.

In the treatment of putrescent root canals periapical conditions result from the use of too strong drugs.

Dr. Buckley, in working out the chemistry of pulp decomposition, and the treatment for putrescent canals, gave us trikresol and formaldehyde as a specific. He showed how the treatment could be sealed in such a tooth without fear of gas pressure. How secure we have felt in the use of it, and now we learn that the formaldehyde is destructive to the apical pericemental tissue, as well as the germ which we pictured as lurking in the dentinal tubules.

In vital teeth if the canals are too fine for proper removal of the pulp tissue and proper filling, the canals must be enlarged first by smooth broaches and next by canal files aided by the decalcifying effect of a 20 percent H_2 SO_4 solution or paste. Just about the time the apical foramen has been successfully reached with a good sized broach, it is suddenly realized that the presence of a strong H_2 SO_4 solution is hazardous.

FILLING.

After the difficulties of devitalizing and of treating putrescent canals, then comes the difficulty of filling them. It is claimed that in every day methods employed in the average dental operating rooms, there is great possibility of infecting directly the apical tissue, and that consequently every such operation should be according to strict surgical procedure. Everything coming in contact directly and indirectly with the patient's tooth should be sterile.

CROWN AND BRIDGE.

In Dr. Goslee's text book on Crown and Bridge work, he gives as the consensus of opinion that all crowned teeth should be devitalized. Now there is fear to destroy the pulp in such teeth because of the consequent local and systemic deleterious consequences. Not bcause Drs. Rhein, Best, Ottolengui and others have shown us how it can be done successfully from the theoretical standpoint, but because in everyday work there is a margin of insecurity between the theory and practice. Consider the dilemma after deciding to devitalize a badly broken down upper bicuspid for the purpose of adapting a porcelain crown, to have the X-Ray disclose one of the impossible roots. Would it be decided to extract and go on to the next one, or to forget esthetics and apply a gold crown or a gold inlay?

If the pulp is left in the tooth which is properly prepared by grinding for the crown, the dentist is confronted by the theoretical surgical impossibility of the irritation of cement in contact with mesoblastic tissue. If the enamel is left under the crown, the gum tissue suffers from the irritation of an improperly fitting band, creating thereby a disposition to gingivitis, and eventually pyorrhea, with the added danger of hematogenous infection of adjoining teeth where the periapical tissue is in a state of reduced vitality.

During this winter I have heard stated before this society, that insanitary bridges were giving way to removable dentures, and the day would come when partial plates would predominate on account of their sanitary features.

BACTERIA.

I want to quote from an article by Hewitt in the March issue of the *Dental Cosmos*. "Adami, in speaking of the defenses of the body against infection, discusses the mucous membrane with its underlying structures, as to its resistance to the entrance of infection and the conditions which allow infections to enter. Bacteria are constantly entering the organism, but in health they tend to be destroyed very soon after their reception. Certain leucocytes or wandering cells passing out on to the surface of the mucous membrane, act as a scavenger, and this either by actually taking up the microbes and digesting them or by carrying them back into the tissue where they can be destroyed. It is not necessarily the destruction of the surface layers which allows infection, the lowering of the vitality of the tissue is of the utmost equal importance."

He goes on to describe cryptogenic infections as lesions occurring in deep seated parts with no apparent break in the integment. "Cryptogenic infection can occur through the unaltered surface of the mucous membrane by the agency of the wandering cells of the organism, if the following conditions exist.

1. The presence of an excessive number of virulent organisms at one surface point.

2. Congestion of a mucous surface with the passage of an increased number of leucocytes.

3. Re-entrance at one region of an undue number of the same, bearing with them microbes.

4. Accumulation at one spot of recurrent deposits of such numbers of microbes that the bactericidal power of these cells become exhausted, and lastly,

5. Temporary or habitual lowered vitality and resistance to the introduction of the microbes."

All these conditions are fulfilled when we have a partial plate resting on the mucous membrane in conjunction with a pulpless tooth, which may have been filled with the utmost care; viz.: many organisms resting on the surface of the plate in close contact with the gum congestion, with the passage of the leucocytes bearing microbes to a weak spot in the apical regions. As suggested our supposedly sanitary partial plates will cause congestion of the gum tissue and consequently increase in the number of germs constantly being carried through the mucosa.

He goes on to say, "All the submucous tissues are subjcted to a shower of pathogenic organisms entering both by wounds and through the tissue surface. The more congested this mucous membrane, the greater the number of germs which will enter."

This explains hematogenous infection nicely and applies to any colony of bacteria in contact with mucous tissue, whether it is on a plate, the saddle of a bridge, in food deposits around the necks of teeth, under overhanging fillings or crowns which encroach upon the gums, or in large deposits of salivary calculus. When any of the above conditions exist there is irritation with inflammation and reduced vitality. This means in the presence of large colonies of bacteria, the bactericidal power of the tissue cells is sooner or later exhausted, and the germs gain entrance to the tissue and blood.

A full complement of teeth, the orthodontist tells us, is necessary to normal occlusion and the normal locking of the cusps of a full complement of teeth is the vital retentive force following orthodontic treatment. Supposing it were necessary to devitalize a tooth through some lack of care during orthodontic treatment, and the X-Ray showed the roots mal-formed and turning off at a sharp angle near the apex, would you extract and create another dilemma?

The physician, the guardian of the health of the individual, may trace or think he traces some systemic disorder to a focus of infection about a tooth and says extract. In such cases the mandate of the physician over-rules the dentist. Perhaps the dentist knows that the patient will be benefited 50 percent from the standpoint of infection, but damaged 70 percent in the loss of chewing efficiency, indigestion and lowered vitality creating a possible dilemma of a vicious cycle of disasters.

PREVENTIVE DENTISTRY.

To all this confusion of conditions, is there any more satisfactory, more effective, and more beneficial answer, than Preventive Dentistry? Preventive Dentistry means, keeping all surfaces of the teeth clean, employing all known means both by the individual and by the dentist, and should be based on Black's statement, "That teeth decay where they are habitually unclean and in structural defects." Consequently there should be instructions to the patient for his individual home treatment and office treatment by the dentist.

HOME TREATMENT.

The instructions to the patient are first: to equip himself with a proper tooth brush, one with the bristles arranged in tufts, and the length of the bristles graduating from the short bristles at the end to long ones near the handle. Inasmuch as it is the end of the bristle which does the cleaning, none of them should be so long that they bend over while sliding the brush over the teeth. This brush reaches the buccal surfaces of posterior teeth, especially because the further distally between the cheek and teeth, the narrower the space. The same holds good on the lingual of the lower molar. Start the brush on the gums, and with a rolling motion sweep down over the teeth. This cleanses the maximum tooth surface by allowing bristles to go between the teeth. It also massages the gums, and keeps them from receding, a tendency brought on by age.

Instruct the patient to use ordinary dental floss for polishing between the teeth in younger people and flat floss in older people, together with soft wooden tooth picks in those whose gums have greatly receded. Use a saponaceous tooth paste and finish with vigorous rinsing of lime water.

In time, with proper instruction, the patient will become most proficient with his mouth toilet. A good idea is to give the patient instruction to start at the hardest place first with the tooth brush, and finish at the easiest. Usually it is the other way, the patient beginning with the easiest place, which is the labial surface of the anterior teeth, a place which is kept fairly well cleansed by lip movement, and the excursion of food in the process of biting.

I have never heard a theory advanced for the popularity of a soap in dentifrices, except that of the action of the soap as a cleanser, and that it is right in line with the alkaline treatment. The theory of the detergent action of soap is partly that of an emulsifier, and largely that of an alkalic regulator, that is by what is known as hydrolitic disassociation. This means the soap is broken down by water into other substances of an alkaline character.

Pickerill's theory of acid mouth washes is a beautiful one, and was loudly heralded by the dental profession, who took to it quickly and extensively. Time has piled up more testimony against it than for it, so that judging from the expression of opinion among the profession the alkaline prophylactic treatment seems to be the most popular.

In the prophylaxis symposium published in the *Items of Interest,* May, 1915, Dr. Fones and others advocate the use of lime water as a mouth wash. The present day idea in Preventive Dentistry is to get rid of the gelatinous plaques in which the lactic acid bacteria flourish, producing their tooth decalcifying products. We are endeavoring to find some solvent for the gummy plaques which form in sheltered places about the teeth, inasmuch as it is almost a mechanical impossibility for the average individual to reach all surfaces of his teeth in his daily care.

Pickerill, and others claim that alkalies are the best solvents for mucin, and it is upon this fact that Pickerill's theory of maintaining an alkaline saliva by means of an acid mouth wash is based.

Pepsin dentifrices have been introduced, and again the theory is beautiful, but as far as I can observe and learn, it does not work in practice.

The solvent effect of these agents mentioned, is more or less slight, and until some agent can be found which when taken into the mouth has quick acting effects, mechanical means will have to be depended upon largely.

Dr. Talbot stated in a paper, or a discussion before the Section of Stomatology of the American Medical Association, that if his solution of Iodo-glycerol was used to swab the buccal cavities three times a week, it would stop decay, and overcome the sensitiveness of denuded roots. Iodin has great penetrating properties as well as germicidal properties, and will penetrate the mucous plaques as well as deposits of fermenting food. In extreme cases of dental caries, I have prescribed this treatment and believe it is very effective.

The patient should appear at the dental office frequently, that is as often as is necessary, depending upon the success of his own efforts, and the tendency for plaque formation.

These plaques should be removed at short intervals, because the lactic acid germ begins the elaboration of its products at once. The rapidity of the decalcifying effects is governed by the resistance of the tooth, by which is meant the molecular arrangement of its structure; by the virility of the germs depending upon their favorable or unfavorable environment; by their carbo-hydrate medium, and by their neutralizing effect of alkalies in coming in contact with the colonies and their products.

It should depend upon each individual, and not be according to a general rule as every year or every six months; it should be every two weeks or every month as seems indicated. If each time the patient returns to the office, a disclosing solution is used, the places which he is not successful in reaching with brush or floss, will be brought forcibly to his attention, and his efforts with his home treatment extended accordingly.

OFFICE TREATMENT.

The office treatment should consist of removing all calcareous deposits above and below the gingiva with delicate instruments preferably the Younger-Good pyorrhea instruments. Next polish with flower of pumice, or some diatomaceous earth, using dental engine with cup and disks. The hand porte polisher may be used with orange wood points instead of the dental engine, and may supplement the rubber cups and disks after which flat floss letter (R) should be used in polishing the proximal surfaces. Not only pass floss between the teeth but polish the proximal surface carefully with plenty of abrasive flooding the field of operation. Finish with spray using compressed air.

The sulci and pits of permanent teeth especially in the newly erupted, should be cleansed with engine polishing brushes and abrasive; then the tooth should be dried and the pits and fissures should be flooded with 20% $Ag\ No_3$ and worked in with a sharp explorer. This should be dried and either white or black copper cement worked well into all the crevices, leaving as much on the occlusal surface of the tooth as is possible without interfering with occlusion. This cement will gradually wear away, leaving the fine lines still sealing the weak places for a long period of time when the same can be repeated.

To consistently carry out this work to a practical degree, the services of a dental nurse are needed, and here another dilemma presents itself. It is hard to find a young lady who will take a dental course, and without a college degree, it is not lawful for an assistant to do this preventive and prophylactic work.

In conclusion I would say that prevention is a modern tendency expressed in the slogan, "Safety First."

That proper prophylactic work prevents dental caries; that it prevents pyorrhea, the disease which is causing the loss of so many teeth, and so much health, and about which there seems to be in the minds of the laity so much mystery. That prophylactic work prevents the necessity of root canal work except in some unusual cases.

That a sound tooth is much better in looks, strength, and a part of the human anatomy than any tooth devitalized, regardless of the most perfect root canal work, and that in children's teeth, it prevents a certain percent of mal-occlusion.

To the patient, it is commercially profitable directly and indirectly, and last of all it is pain profitable.

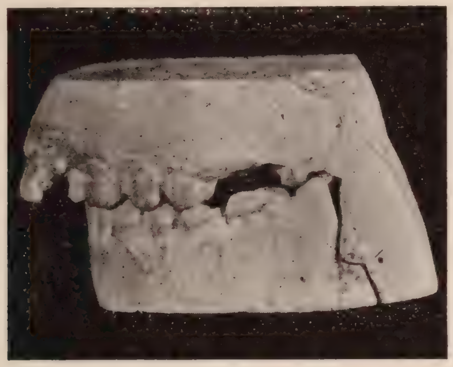
I trust that the profession will work out some solution of this situation which will enable the dentist to carry out the idea of preventive dentistry to the last degree.

ORTHODONTIA BY BRIDGEWORK.

BY H. E. BLILER, D. D. S., CHICAGO, ILLINOIS.

Orthodontia should be considered from many angles and viewpoints, namely:—the time required to correct the mal-occlusion, the inflammation created, the inconvenience to patients, their financial status, and the best mode of procedure to obtain quick and lasting results.

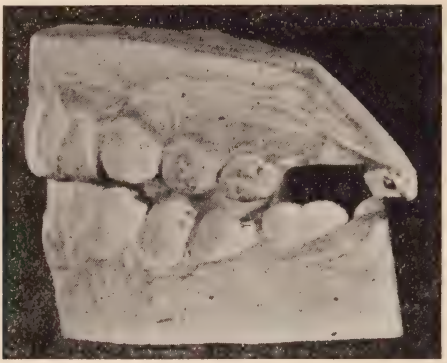
Every general practitioner should be able to correct simple cases, especially where it is not possible to refer the patient to a specialist, as in the smaller towns and rural districts,—and where the patient cannot afford to spare the money and time required, as in the case appended: Miss D., age 15 years, was sent to me for dental service. Consultation was held February 13th, 1916. February 14th, I sent her to an Orthodontist with an attendant, to learn his views as to time, manner and cost of the work. After much inquiry no information could be obtained,—the Specialist simply saying the filling would have to be done first before he could give a decision.



No. 1.

I took an impression of both jaws February 15th, by having her bite into wax as per Figure 1. I then extracted both Centrals, which were large, and killed the pulps in the two pencil-shaped lateral teeth. February 29th, I cut the lateral teeth off, finishing the work by March 3d, putting in a four-tooth bridge, using porcelain interchangable teeth, with the half-band attachments. Fifteen days was allowed for shrinkage or absorption of the "V" shaped arch.

In my opinion it was the correct solution of the case regardless of her ability to pay more or less. It might not accord with fine-spun theory on Orthondontia, but you obtain gratifying and lasting results, as can be seen from the models of the mouth, before and after. She was not able to keep her lips closed on account of the prominent Centrals, as per the picture. I get good results many times by extracting the lower central in badly crowded conditions rather than torturing the patient by trying to widen the arch, or by extracting the first bicuspid and trying to move several teeth over. By extracting the central, the teeth will straighten themselves out, and it is good practice for poor patients, who otherwise would have crowded teeth all their lives. I extracted a lower lateral tooth for a man, 37 years old, and the teeth straightened,—without any appliances, in a years' time.



No. 2.

PREVENTIVE DENTISTRY.

BY W. IRVING CARLSEN, D. D. S., CHICAGO, ILL.

Preventive dentistry seems now to be a nation-wide watchword even to the extent that many public-spirited individuals have taken the initiative and brought before their communities men of national reputation to give instructive talks. This puts the dentist in a position wherein he must of necessity become a great community factor.

In the past decade or two much effort has been brought forth to perfect means to prevent caries and other pathological conditions of the teeth and surrounding organs. There can be no question of a doubt but what oral prophylaxis represents the highest development in dental science. We have long been taught that a clean tooth will not decay and I believe that the same rule holds true that a clean tooth kept clean will not become affected with pyorrhea.

We now come to the point to decide what a clean tooth really is. A tooth which has had a cursory brushing with pumice stone is manifestly clean but its state of cleanliness is of but short duration. Such cleaning done once or twice a year will not keep the mouth in a prophylactic condition. A clean tooth, and I mean a tooth which is as surgically clean as it is possible to make it must of necessity be one which has had all of its scratches and pits eradicated and then be brilliantly polished.

This process may seem at first sight to be very elaborate and tedious, but on close analysis we find it to be a very desirable one from all angles. From the patient's standpoint the ultimate result is the one to be sought. Therefore, for this one reason it seems altogether logical to me that the placing of a mouth in such shape as to reduce the possibility of caries and pyorrhea to a minimum is a true service giving procedure.

This process of placing the mouth in a prophylactic condition by means of extensive tooth polishing can be brought about in the following manner: With the gem points or other composition stones of fine grit the tooth should be ground until the grosser ridges, grooves and pits have been removed. If the stone be kept cool with a stream of water, this operation will not be painful. Arkansas stones are now used to complete the grinding operations. The interproximal surfaces of the teeth can be planed with interproximal trimmers and smoothed down with sandpaper strips.

Now we come to the root of the tooth and the methods of polishing it. With scaling instruments the root must be planed smooth of all its pericemental pits and grooves. It is of extreme importance that these be removed, for, microscopical as they are, they are tiny culture beds for pyogenic organisms. One should take particular care in this part of the operation to use a scaling instrument that will not leave scratches and grooves on the root.

After the root has been thoroughly planed and smoothed, the enamel shoulder just under the gingivae should be carefully rounded. Nature will not tolerate any sharpness or roughness and therefore because the sharp enamel shoulder is irritating to the delicate gum tissue it should be smoothed.

We will now thoroughly disk the crown of the tooth, using first a coarse sandpaper disk and ending with cuttle fish disks. In this process all of the tiny scratches which were left from the stones are removed. This will leave the tooth in a smooth but dull condition. A very high and lastingly brilliant polish can be put on the tooth by first using a moosehide wheel charged with silex and finishing with a rubber cup charged with whiting and oxid of tin. Wide polishing tape charged with these powders will effectively polish the proximal surfaces of the teeth. The necks of the teeth must receive considerable attention and should be polished with an orange wood point and silex. For this purpose an engine porte polisher is a very efficient instrument.

These are the salient features in the process of polishing teeth. To sum up the whole, we find that the practice of oral prophylaxis is remunerative and with the cooperation of the patient in the daily cleansing of the teeth and surrounding structures we can do much toward the actual prevention of many obscure and seemingly incurable diseases to which the human flesh is heir.

FUNDAMENTAL COLOR HARMONY IN TOOTH SELECTION.*

BY J. H. PROTHERO, D. D. S., CHICAGO.

Harmony of color, form and arrangement of artificial teeth in full denture construction are vital topics which from an esthetic view-point will ever be of interest to the prosthetist whose heart is in his work.

That the solution of these problems, in a manner capable of practical application by the average practitioner and student as well, is yet incomplete, is evident from the glaring incongruities seen in the mouths of the passing throng.

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*Read before the Chicago Dental Society, March 21, 1916.

The selection of teeth of appropriate color and form to harmonize with the color scheme and facial lineaments of the patient, and their anatomical arrangement in the dental arches in such manner as to appear natural and deceive the most observing, requires the knowledge and intuition of an artist, and the touch and finger skill of a master artizan.

Consider for a moment the deplorable condition of an individual, who, from whatever cause, has lost those priceless pearls of beauty—the teeth. Speech is seriously interfered with, the ability to masticate food is lost and facial expression is marred—sometimes to a woeful degree. These conditions have a depressing influence on both the mentality and health of the individual, and if not efficiently corrected, will detract from the pleasures of life and shorten the period of existence.

The province of the prosthetist, therefore, is one of grave responsibility, for the mental poise, good looks and health of the patient are in his hands. Fortunate indeed is it for the patient when the prosthetist fully realizes the full significance of his responsibility, and possesses the artistic talent as well as technical skill necessary to correct the ravages occasioned by loss of all of the teeth.

The subject to which attention will be directed this evening deals with one phase of esthetics in the production of full dentures, viz.: the color problem in tooth selection.

In an effort to formulate some plan which might prove serviceable in the selection of teeth of suitable color for each individual case, the writer has, from time to time, recorded the general color schme of persons in a normal condition of health, together with the colors displayed in their natural teeth.

Although these examinations have been numerous and carefully carried out, yet an analysis of the records fails to disclose any definite or fixed correspondence in colors between teeth and complexion. In fact the most unlooked-for results are at times noticeable: strongly tinted yellow teeth in which a tinge of brown is seen being associated with light, neutral gray complexions; and again, very light gray, neutral tinted teeth being associated with pink or reddish brown complexions. These cases, however, are exceptions, yet they inhibit the formulation of any fixed rule.

In 80% of cases, blue, brown, orange, yellow and gray tints found in the teeth, were also found in the eyes, but without definite correspondence as to proportion. In less than 50% of cases was any correspondence found between tints of teeth and color of hair. This, however, can be accounted for because the hair, although showing a greater range from light to black than the teeth, presents fewer varieties of pigment colors.

This experience of the writer, which coincides with that of many others, confirms him in the opinion that the problem of the selection of teeth of harmonious tint to coincide with the color scheme of the individual, must be solved in some other manner.

We must then turn to a study of color harmony, in the hope of finding something of value in the solution of this problem.

Esthetics is defined as "The philosophy of the beautiful;" "Esthetics, the science which deduces from nature and taste the rules and principles of art——."

Harmony is defined as "Any arrangement or combination of related parts or elements that is consistent or esthetically pleasing; agreement of particulars according to some standard of consistency or the esthetic judgment." (Cen. Dic.)

Specifically then, complete harmony demands for its realization, not only correct form and arrangement of parts, but correct color schemes as well.

The combining of colors to produce color harmony in any field, before proceeding to apply them, requires a knowledge of fundamental principles. An extensive inquiry among members of the profession discloses the fact that very few have had any special training along these lines. Therefore, to present this somewhat complex subject in the clearest manner possible, a few essential facts relative to light and color will be briefly outlined.

Light is the "form of radiant energy that acts on the retina of the eye and renders visible the objects from which it comes; the illumination or radiance that is apprehended by the sense of vision."

The radiant energy given off by the sun is the principal source of terrestrial light. Under ordinary conditions light emanating from this source is white, or as far as the eye can discern, is devoid of color. When, however, a ray of sunlight is passed through a prism or over a diffraction grating, it resolves into a series of tints known as spectrum colors, viz.: purple or violet, blue, green, yellow, orange, red and purple.

Three of these—blue, yellow and red—are known as primary colors, since by the proper admixture of them practically all other colors are produced.

A mixture of two primary colors in equal parts produces a secondary color, of which there are three, viz., purple, by combining blue and red; green, by combining blue and yellow; and orange by combining yellow and red.

A mixture of two secondary colors in equal parts produces a tertiary color, of which there are three, viz., citrine, by combining orange and green; olive from purple and green; and russet from orange and purple.

Lying between the secondaries and tertiaries are the intermediate colors, of which there are six, viz., sulphur or yellow-green; saffron or yellow-orange; turquoise or blue-green; campanula or blue-purple; garnet or red-purple; and nasturtium or red-orange. These are formed in two ways: first, by combining three parts of one primary with one part of another primary; or by mixing equal parts of a primary and a secondary. For example, to produce nasturtium equal parts of orange and red are combined. This is equivalent to mixing three parts of red with one of yellow.

It has been observed that certain colors when ranged alongside of each other look well, or *harmonize,* while other combinations are more or less displeasing or discordant. Those colors which are pleasing and satisfying to the visual organs are termed complementary colors, a name which, as will be seen later, indicates why they are so called.

To the eye, sunlight--subdued or diminished in its intensity to such degree as the optic nerve can tolerate with comfort—is the most satisfying to the visual organs. This is true of the more brilliant white varieties of artificial light. Natural light, as has been shown, and white artificial light as well, can be resolved into primary and secondary colors by means of the prism. Take away one single color, and the remaining light is tinged according to the proportions of the remaining constituents.

Although the eye can tolerate light composed of incomplete spectral colors, the visual organs tire more readily when so subjected than in white light. This is explained by an examination of the histological structures of the retina, and the manner in which light acts upon them.

The retina is a delicate, highly organized membrane lining the interior or concavity of the eye-ball, and against which the transparent, vitreous humor rests. It is composed of ten layers of tissue consisting of an internal limiting membrane next the transparent, vitreous medium; a fibrous layer of nerve filaments from the optic nerve, of which it is estimated there are about 500,000 terminals; a vesicular layer of ganglionic nerve cells; an inner molecular or granular layer; an inner nuclear layer; an outer molecular or granular layer; an outer nuclear layer; an external limiting membrane; a layer of rods and cones (Jacob's membrane); and a pigmentary layer resting against the choroid or outer capsule of the eye-ball.

In the interior of the eye, at the back part, and in direct line with the passage of light through the diaphragm, is a raised spot on the retina about 1½ mm. in diameter, known as the macula lutea or yellow spot of Soemmering. The center of the macula lutea is depressed, the concavity being formed by gradual discontinuance of the various layers of the retina presenting toward the source of light, until nothing but the cones and the pigmentary layer remain of the ten original retinal structures. This depression is known as the fovea centralis or direct center of vision, and is that spot in the eye which receives distinct form pictures. Red, green and yellow pigments called chromophanes are found in the cones, while rhodopsin or visual purple is found in the rods. Both constructive and destructive metabolic changes occure in the pigments of the rods and cones, due to the action of light waves, and as necessity requires, the pigment layer of the retina supplies new material.

The rods are the specialized terminal organs of color vision, and although absent form the fovea centralis and the greater portion of the macula lutea, are well distributed over the remaining portion of the retina.

Although sensitive to all colors, the rods seem to be specialized into three groups, one of which responds most readily to red, another to blue, and a third to green sensations.

Since green is composed of blue and yellow, the rods most sensitive to green are most active to yellow impressions as well.

It will thus be seen that although the specialized color organs of the eye are capable of receiving all impressions, they are in reality most sensitive to the three primary colors, viz., red, blue and yellow.

Color sensations, as before stated, subject the eye to both destructive or catabolic, and constructive or anabolic metabolism. The former induces visual fatigue, the latter integration and rest.

When one gazes intently at a monochrome object, say of red, for two or three minutes, or until the specialized organs become saturated with that color, and then closes the eyes, an after picture of the object will appear in green. The explanation is that the destructive metabolism in the cones acted upon resulting from long-continued gazing at one color, by reflex stirs into activity those cones most sensitive to the remaining spectral colors, and thus, in the secondary or after image, supplies those colors necessary to complete the spectrum and produce the sensation of white light. This after image, therefore, is called a complementary color.

After gazing intently at a monochrome until the eyes are tired, if, instead of closing the eyes they are directed to the complementary of the tint first viewed, thus bringing into activity the cones not affected by the first impression, a feeling of rest and comfort ensues similar to that which follows the formation of the automatic complement by eye closure.

Each color, whether primary, secondary, tertiary or intermediate, has its complement, which may be formulated by supplying those colors lacking in the main color scheme. For example, the complement of blue is orange, and of orange, blue; yellow and purple harmonize, as do red and green. If red contains a little blue turning it toward purple, its complement, green, must contain a little more yellow, etc.

Once one becomes familiar with the crude colors and their complements, the reading of attenuated colors becomes comparatively easy, and the discernment of complements, or those tints which harmonize, becomes intuitive.

It is the belief of the writer that through a study of crude colors and their complements, the color judgment can be developed in a very practical manner so as to be of great assistance in determining what shade of teeth will harmonize with the color scheme of any individual. Those who, by a glance at a patient's face can select a suitable shade of tooth, without apparent effort, unconsciously utilize the color functions of the eye.

A few words in regard to what may be seen in natural teeth, and what to look for in the patient's face may be helpful to those in whom color perception is somewhat negative.

Look for variations in the color of the natural teeth of different individuals, as well as variations in the teeth of the same mouth. Notice that each tooth presents varying depths of tint or shade of the same color, while frequently two or more colors can be detected in the same tooth.

The most pleasing teeth are those which present a variety of shades, tints and colors, all so softly blended as to show no sharp contrasts. Sameness of color and strong contrasts alike are to be avoided in the selection of teeth for artificial substitutes. Regardless of how well arranged they may be, teeth of either class mentioned present a monotonous and artificial appearance, and the esthetic quality of the denture is impaired.

In addition to offering a suitable display of various colors, and their harmonious blending in the different teeth, the dentures as a whole must harmonize with the setting in which they are centrally placed, viz., the patient's face.

The colors discernible in an individual's complexion depend to a certain extent upon the keenness of color sense of the observer. Some possess highly developed color functions of the eye, while others show but little ability to detect attenuated, or even comparatively crude colors. Dr. Wm. Thompson of Philadelphia estimates that about one man in 25 is color-blind, while not more than one woman in four thousand is so affected.

Let us for a moment stray into the field of art where from time immemorial the endeavor has been to imitate nature in all her beauteous forms. The artist in depicting a face in colors, on canvas, lays his pigments on the palette somewhat as follows: flake white, yellow ochre, raw sienna, burnt sienna, crimson alizarin, vermillion, Indian red, Antwerp blue, ivory black, bitumen, oils, etc. These mixed in varying proportions produce the pink flesh tints, the orange, ivory or neutral grays of the general complexion, the pink, red or purple of the lips, the gray, olive, brown or purple shadows, the tints disclosed in the iris, and the eye-lashes, brows and hair.

In the hands of a master, a very life-like and color-true portrait can be produced with these or similar pigments. According to his discernment of color and skill in mixing pigments, the artist paints what he sees in the subject's face. He is a color expert whose mission it is to translate from nature to canvas the tints he reads.

This expert's palette may well serve then as a key for the prosthetist in his search for the colors displayed in the complexion of his patient. He should strive for general color analysis and determine the dominant tint of the face as a whole—whether light, neutral gray, yellow, orange, pink, light or dark red, purple, brown or olive.

It is best to search for actual colors, rather than attempt to classify according to the temperamental system in which the indefinite terms, pallid, swarthy, sallow, florid, ruddy and muddy are used.

These names may mean one thing to one person and a different thing to another. Colors should be read and translated in intelligible terms. The study of crude colors and their complements is a pleasure. It will greatly benefit the one whose color judgment is defective, and add refinement to the efforts of the one in whom this faculty is keenly active. It is in reality, scientific training of the visual organs and can be pursued by all, even the color-blind, with benefit.

Spencer says: "We do not for a moment believe that science will make an artist. While we contend that the leading laws both of objective and subjective phenomena must be understood by him, we by no means contend that knowledge of such laws will serve in place of natural perception. Not only the poet, but the artist of every type, is born not made. What we assert is, that innate faculty alone will not suffice; but must have the aid of organized knowledge. Intuition will do much but it will not do all. Only when Genius is married to Science can the highest results be produced."

CORRECT INTERPRETATION OF X-RAY FILMS.*

BY RALSTON I. LEWIS, M. D., D. D. S., CHICAGO, ILL.

The object of this paper is not what the subject might suggest, because I cannot consider that any skiographer is in a position to make a diagnosis from an X-ray film. But I am hoping (in a very humble way) to give you herewith some elementary principles of radiograph reading, which, associated with the pathological conditions in each patient of yours, may aid you in making a correct diagnosis—for without a correct diagnosis the treatment of any condition is pure folly, and not only a waste of your time, but equally of the patient's. Therefore, when you decide to have a radiogram taken you ought to consider the following:

1. PATHOLOGY.

Definition.—That branch of science which treats of the etiology, manifestations and results of disease.

Under this head we will consider *cellular pathology,* or that which concerns the cells as the basis of vital phenomena. I am speaking of special dental pathology at this time, because certain forms of pathological conditions, such as impacted teeth, fractured roots, bone cysts, calculi in ducts, infected antrums, sub-periosteal inflammations, serous exudates, cellular infiltrations and abscess formations manifest themselves very clearly upon X-ray plates or films.

We are just beginning to realize how essential it is to conserve the pulp of a tooth, knowing as we do that from 80 to 85% of teeth with pulps removed show pathological conditions arising at some future time. The medical man is over-anxious just at this time to exert a special effort in resorting to an early extraction of teeth showing abscess formation. This is certainly a misconstrued idea and if the physician will send a specimen of this abscess pocket to the laboratory after extractions, he will find (according to some members of the Chicago Dental Research Club) that 50% of the specimens do not show any pathological condition.

They claim that if an abscessed tooth be properly treated and cured, that there may remain at the apex, a small amount of connective tissue. We must believe in the infallibility of the radiograph, knowing that it has definite and unchanging chemical and physical laws, but unless we know these laws, we will certainly be misled. Therefore, we know the radiograph unfortunately has its limitations. Do we believe what a researcher tells us? We should either believe him or give a good reason for our disbelief.

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*Read before the Odontological Society of Chicago, Feb. 1, 1916.

Realizing as we do that the pendulum has swung too far in the opposite direction, it behooves us to know just when to extract—although some of the best men are now extracting teeth where, before the use of the X-ray, they endeavored to save them with prolonged treating. The patient becomes dissatisfied and seeks professional work elsewhere.

I do know that one of the greatest uses of the X-ray is in diagnosing conditions, which we have no other means of finding out. All pulpless teeth should be X-rayed—especially in a new patient, before the Doctor attempts to proceed. Why?

1.—Psychological effect upon the patient, and allow me to say that we should all appreciate the necessity of team work.

Appreciating this fact as I do, I have instructed my assistants never to make a diagnosis to anyone, not even to the Doctor himself.

Nine patients out of ten will say, "Now, Dr. Lewis, can I look at the picture?" And I immediately tell them that it will be impossible to make a reading because the film is still in the solution, and it will take an hour or more before it dries. They therefore say, "All right, then, we'll come back." And by the time they come back the film will be in the Doctor's hands and I instruct them to go to their Doctor and he will be pleased to tell them all about it.

I am frank to confess that sometimes I am forced to say to the Doctor, "This X-ray shows me nothing." The patient returns in two weeks, X-ray is taken, and if the pathology has progressed far enough (namely, the dissolving out of lime salts) you may make a positive diagnosis because there is a liquefaction of bone tissue replaced by cystic formation and it shows very clearly upon an X-ray film.

After pathology comes:

2.—Trauma—(Fractured roots, bone, etc.).

3.—Conditions surrounding the tooth.

(1) Number and size of canals.
(2) Over and under filled root canals.
(3) Pulp-stones.
(4) Pyorrhea.
(5) Tortuous roots: In this condition alone the X-ray eliminates all guess-work; you know exactly what you are doing, and if you meet with resistance, the X-ray is then employed to ascertain the exact degree of tortuosity—the size and length of the root, which are of the utmost importance.

Remember that an X-ray film showing an occlusion of the apical one-third of a root, does not always mean that such a condition exists, for this reason: An X-ray machine has not yet been made which enables us to take an instantaneous picture, producing exact conditions, because the slightest movement upon the part of the patient (such as breathing, etc.) during an intermittent exposure, allowing the film to move even 1/1000 of an inch, will cause you to make an incorrect reading. This should be remembered in ascertaining the length of a canal.

One of the first essentials of radiography is to reproduce the teeth exactly, and at normal size. To attain this end, the X-ray machine must be properly focused, so that the rays will strike the film at right angles.

With the march of progress and the passing years, we see the demands upon us increasing—along with a growing appreciation of conservative dentistry. Upon our shoulders is placed a grave responsibility which certainly must not be shifted if we want to produce 100% efficiency. We must be able to help discover the hidden cause of any disease and co-operate with the physician in such a diplomatic fashion that he cannot possibly misinterpret our intentions, nor we his.

I have in mind just now a case referred by Dr. L., a physician, to Dr. H., the dentist, and in turn referred to the skiographer. Pictures taken. The patient, a man of 55, had been confined to his bed for 6 months. The physician's diagnosis follows:

Aortic stenosis.

Etiology.—Rheumatism, with a center of foci surrounding abscessed teeth.

All other etiological factors having been removed, it was definitely decided to have the teeth extracted. X-rays were taken, which determined the center of the foci; the patient was removed to the hospital, where Dr. H. extracted the affected teeth. The man remained in bed and the aortic stenosis was treated in the regular way.

At present I am happy to report to you that this man is slowly mending and that doubtless health will be restored to him as soon as the heart can compensate.

I might relate to you any number of similar cases, but for the present it will suffice to say that it is extremely unwise to make a hasty diagnosis, with all diagnostic symptoms positive in character.

> "Only the Master shall praise us
> And only the Master shall blame,
> And no one shall work for money
> And no one shall work for fame.
> But each for the joy of the working
> And each in his separate star,
> Shall draw the thing as he sees it
> For the God of Things as They Are." —Kipling.

THE AMERICAN AMBULANCE RED CROSS HOSPITAL.

BY OWEN E. CASSILL, D. D. S., CHICAGO, ILL.

(Part One.)

It is not my purpose to tell you what I can do or have done, but it is my pleasure to give you in a simple, frank manner a general idea of my experiences and observations at the American Ambulance Red Cross Hospital in Neuilly-sur-Seine (Paris). It was a great opportunity to see and learn in a practical way, not alone as a dentist but as a general training. It is of course about what any other ordinary dentist would have seen and done under the same conditions. Mr. Lincoln said: "The Lord must love the ordinary people because he made so many of them." I believe this is true of dentists as well. Since it was my good fortune to be at the ambulance (as used by the French it means a military hospital), I will attempt to make the trip with my readers in a short series of articles and I hope it will not only prove interesting but useful as well.

I visited Europe in June, 1914, and as it happened war began while I was there. I remained until October. It was during this time that thoughts first came to me about joining the dental section of a Red Cross Ambulance and later I wrote to the American Ambulance in Paris, and was referred to Dr. Truman W. Brophy, who gave me the appointment. This was during the latter part of September, 1915, and I sailed October 9th.

I believe before taking up the journey it will be better for us to have a fairly good conception of just what the American Ambulance is, so in a general way I shall describe it. The American Ambulance Hospital was established in September the second month of the war. The first wounded entered the ambulance September 7, 1914. Note how quickly the Americans responded to the need of the suffering, as has always been characteristic of them. It is not necessary, then, to dwell upon its inception or inspiration. It is enough to say that the Americans who were in France at the beginning of the war as residents or as visitors organized this hospital as an effective means of relieving distress and at the same time expressing in a practical way the gratitude of Americans toward the French.

It is purely an American hospital, financed and managed voluntarily by Americans. Most of the surgical and nursing staff are Americans. This ambulance has the distinction of being the first to have a dentist on its medical board—so here again Americans set the pace abroad. A large and beautiful school building, just completed, was turned, under the supervision of an American architect acting in conjunction with American surgeons and dentists, into a modern hospital, completely equipped with the best appliances. It is fitted with X-ray machines and laboratories, dental department with large laboratory and sterilizing rooms (about which we shall speak later), ultra-violet ray filtering apparatus, operating rooms, pharmacy, linen and bandage rooms with a place to wash, sterilize and repair them, diet kitchens and dining rooms, carpenter shops for making splints and what not, sun rooms, library, music room, and all other requirements of present day surgical science. The building and its surroundings are made beautiful and inviting by gardens, flowers, and fountains arranged as the French know so well how to do.

Although the cases sent to the ambulance are of the severest type the death rate averages less than 5 per cent—more than ninety-five of every hundred who enter have been saved—weighty tribute to the skill of Americans. Of the severe cases, many have been sent to the ambulance because of its superior facilities to deal with facial wounds. This department, which was an innovation, has been able to restore frightfully disfigured men to something like their normal appearance. Dr. William H. Potter, Professor of Operative Dentistry, Harvard University, and who was at the American Ambulance three months and at the Imperial School of Dentistry, Berlin, for the same length of time says in the Harvard Graduates' Magazine: "The dentists serving at the American Ambulance work under peculiarly favorable conditions. First of all it should be mentioned that the chief surgeon of the hospital is extremely appreciative of the services which a dentist can render in cases of wounds to the face involving bones of the upper or lower jaws. He also appreciates what the dentist can do in establishing a condition of cleanliness and comfort for the mouth of every soldier in the hospital, no matter where he has suffered wounds. It was a fortunate circumstance that the chief surgeon came of a family of dentists. His father and brother were of that profession, therefore, he knew much of the need of dentists in a military hospital and so helped to bring about co-operation. At the American Ambulance there is the most cordial co-operation between the dentists and the general surgeons. Advice and assistance were freely interchanged, and the results obtained were possible only through such co-operation. The problem of supplying bone lost and of restoring lost contour of the face was worked out more completely at the American Ambulance than in any other hospital as far as I could learn. In the production of anesthesia the dentists used the most approved technique laid down by German authorities."

Through patience and skill with all departments co-operating together, appreciating their interdependence, such as general, plastic, oral, dental, ocular, and nasal surgeons, men whose disfigurements would suffice to bar them from their place in society, and make it impossible for them to earn a livelihood; men with faces, jaws and noses shot away, may return to their families and friends and resume their old occupations. In some of these cases, as of the blind for example, it was necessary to direct training for re-education.

Another feature of this hospital is the very accurate plaster reproduction of the head and face of the wounded. This plaster reproduction was made as soon as the patient arrived and made permanent a record of the exact condition of the man before treatment. After the work is complete another reproduction of the face and head is made. In addition to this photographs are made on entering and leaving the hospital. These, together with X-ray photographs, surgical and medical histories and appliances used are filed.

Boy Scout.

The staff complete is made up of surgeons, physicians, dentists, nurses, auxiliaries, orderlies, boy scouts, motor ambulance drivers, and helpers. The auxiliaries or assistants in the various departments are recruited largely from American women who live in Paris. These untrained helpers who are unusued to the hard menial tasks they now render have gone on day after day, month after month, through summer and winter, early and late, carrying out intelligently and faithfully orders given them and winning the everlasting gratitude of the suffering wounded. The boy scouts are French. I have added a picture of one to show you how they look. The picture is enough to tell you what fine fellows they are.

Motor Ambulance

There are about 150 motor ambulances in the service proper, and about 200 total, including trucks, supply cars and the like. All of the drivers are volunteers and with four or five exceptions are American. Most of them are college men. I remember one fine young fellow, a son of Dr. Hall, of the University of Michigan. He came into the dental section for an extraction and as it happened was assigned to me. I learned later that he was killed on the field. Here is a picture of a small motor ambulance. They are known as "Flying Bedsteads." The motor ambulances transport a monthly average of about 12,000 wounded. They have their own quarters at the ambulance and are supplied with pool tables and other amusements, such as music, games, etc. It is not unusual for physicians, surgeons and dentists to join with the motor ambulance drivers after they finish the requirements in their own department.

The approximate average daily cost per patient is seven francs fifty or about $1.28. The average daily cost per patient in Bellevue Hospital, where the cost is the lowest of any other New York hospital, is $1.86. The ambulance is conducted on the strictest economical plan. For instance bandages are washed, sterilized and patched. Here is a picture of a corner in this section that shows how the ladies help. It is much more expensive to conduct a surgical than a general hospital and, of course, the cost in a country at war is more than in normal time. The very low cost at the ambulance is made possible by the fact that the surgeons, physicians, dentists and auxiliaries give their services without pay. It should be mentioned that the American Ambulance receives no subsidy from the French government. The entire expense is born by Americans. *(To be continued.)*

Making and Repairing Bandages.

A BETTER PROFESSIONAL STATUS.

BY DR. J. L. HELMER, BUNKER HILL, INDIANA.

The vision in the eyes of the public is dim when looking at the profession of dentistry. They see but faintly the outline of a scientist, for to them dentistry is restricted to the teeth alone. To the public the setting of a fractured jaw or an oral operation comes within the sphere of surgery and of course must be looked after by an M. D. Many are there in the medical profession who can attend properly to these operations, thanks be it, but the public, and I believe some of the medical profession, considers it beyond the scope of dentistry.

Why is this? Why is dentistry not honored to a higher level? I say that it is for lack of proper education. Is it for the lack of the proper education of the public? Possibly to some extent, but largely to the lack of sufficient education of the dentists. Are the dentists who are recently graduated and licensed, proficiently prepared? Do they know the human organism sufficiently; or the possibility of certain drugs used in general medicine? Are they prepared to recognize symptoms and manifestations of systemic disease as readily as they should? What per cent of the dental practitioners is there who are capable of an operation for necrosed bone or one upon the Antrum of Highmore? What percentage of the dental practitioners is there who do not call in a physician to resuscitate a person from shock or collapse, because they are frightened? I met a young graduate and recently licensed dentist (this was a little over five years ago) who said to me that he would be afraid to use strchynine or atropin hypodermically upon a patient. Why was this? Just because he had not had the sufficient education and training to teach him the use and necessity of these drugs in emergency.

Dentistry is considered by some as a branch of medical science; the public knows nothing of this fact, but considers us as do many of our medical brothers, nothing other than mere mechanicians. To the public, the extraction of a tooth is worth 50c; that is the value to them of the services rendered, when in many cases the extraction is more difficult and dangerous than a tonsillotomy. But when dentistry becomes truly a branch of medicine; that is—

when a graduate of dentistry will also be a graduate of medicine, then dentistry can be classed as a branch of medicine, for dentists then will have the scope of the whole organism, consequently their work could be better and more scientifically attended to.

I pray that I may see the day and that it may not be far off that when a person receives a degree of D. D. S., D. M. D. or L. D. S., he first will have to be an M. D.

Under this condition, which I advocate, the medical profession will look upon dentistry as at least equal to their profession and there will be more consideration shown.

The question now comes up, "What will the public do because there will be a lack of dental operators owing to the fact of the length of time required to get the dental degree?" But this can be taken care of very easily, for even today some are advocating the trained dental nurse. And under this new condition the trained dental nurse will work similarly to the medical nurse today, that is they can be licensed to do the mechanical dental work, and to assist in the surgery and medical supervision of the M. D., D. D. S.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held March 21, 1916, with the President, Dr. F. B. Moorehead, in the chair.

Dr. J. H. Prothero read a paper entitled "The Fundamental Color Harmony in Tooth Selection."

DISCUSSION.

Dr. G. W. Dittmar:

I feel a good deal like the fellow who depended upon inspiration for what he was going to say. I did not have a chance to see this paper until six o'clock this evening, and I have not had time to carefully read it. I have listened to Dr. Prothero read it, but the farther along he got the less became my inspiration, and the more my perspiration, and I feel that I am in that state now. Not however because the excellent paper we have just heard should not inspire us to study more this interesting subject, but because I am not prepared to discuss it. The paper is of a different character from what I really expected, not from the standpoint, however, of its not being thoroughly scientific. I expected it would be a scientific paper, but really much of it is too scientific for me. It has shot over my head, and I am not in a position to discuss it as it should be discussed. I will say, however, that I took occasion to look into some of the literature on the subject of colors in relation to artificial teeth, but most of it will not apply to the subject in hand. Dr. Prothero has presented something which is practically new from our point of view. In fact, in all the older prosthetic text books you will find nothing similar to that which he has just presented. I will say, however, that in Dr. Prothero's new, excellent book you will find considerable of what he dealt with tonight, though he went into the subject of optical phenomena much more deeply than he has in his book.

The thing that bothers me, and I think it will the average man, is how we are going to apply this knowledge. We may have a knowledge of the primary colors, of the secondary and tertiary colors, etc., and know how to mix and blend these colors to get certain other colors, but how will that knowledge help us to any great extent in the selection of artificial teeth for the edentulous mouth? The selection of artificial teeth where a few teeth are missing, when we have the natural teeth to guide us, is not a difficult problem unless we are color blind. We frequently see crowns or artificial teeth alongside others that do not harmonize. There is no excuse for such lack in observing the colors in the natural teeth that the artificial teeth will fail to harmonize with the remaining teeth. But to select teeth for the edentulous mouth is another proposition, where we have nothing but the patient's face to guide us. There, I do think, if we acquaint ourselves with the subject of color, study it as we should, we can learn a great deal that will be of benefit to us. In the past we have simply taken what knowledge we had or could get from the old text books which took up the subject of temperaments, and we have all read articles that have been published on the subject of temperaments. One in the "American System of Dentistry," published by Dr. Robert S. Ivy, in which he gives a very elaborate outline presented by Drs. E. M. and J. Foster Flagg, illustrating temperaments and their different characteristics, telling us that people with a nervous temperament should have teeth pearly gray with a bluish tinge, and a person with a lymphatic temperament should have pallid, opaque, muddy yellow colored teeth, and that the person who has a bilious temperament should have strong bronze-yellow colored teeth. Those with a sanguine temperament should have teeth that are cream yellow, darker at the gingival portion. These temperaments we have as a basis, then the combination of temperaments, as the bilio-nervous, etc., and the change in tooth coloring caused by the combinations of the different temperaments. We, however, read in the later literature published by Dr. G. W. Clapp and in the investigations made by Dr. Leon Williams, that the temperaments have very little to do with the colors, as Dr. Prothero has stated tonight. They have very little influence so far as the color scheme goes with the teeth. Take a person with a bilious temperament and you may not at all find the color of the teeth you expect to find. Take a person with a nervous temperament and you may not find the character of teeth you expect to find. So the temperamental theory has been upset both as to forms and colors of teeth.

In this discourse tonight by Dr. Prothero, it seems to me that he should have gone further. He has not pointed out to us the application of the material he has given us. How can we apply these things of which he tells us in a practical way? The teeth as general things are the first tissues we see when the mouth is opened. They, we may say, represent a picture. The frame around this picture—(the teeth) are the lips. The lips may be red or purple or pink or pallid. To select a picture that will harmonize with the frame is what we must do—select teeth to harmonize with the colors in the lips and face. There is where we can apply our knowledge of colors—but a patient may have purple lips, or pallid lips for a while, and later on have ruddy lips; or the reverse. It depends upon the condition of health and age of the patient. It is different when we select the teeth from what it is after a while, the sourroundings have changed, and the frame needs a new picture—different colored teeth. If we select the teeth according to the surrounding colors and the surrounding tissues change in color and the color of the teeth which we have placed remain fixed, we likely will not have complementary colors and have a lack of harmony. There is a change in the frame of the picturue, but the picture remains much the same and as far as the color of the artificial teeth is concerned—the teeth look "false."

I want to reiterate to an extent some of the things which Dr. Prothero stated. He said, in substance at least, that we see many sets of teeth that are entirely too light in color and others that are too dark for the individual; that there is not the harmony of color there that should exist, all of which is true.

There is another criticism that could be made and should be made, and that is the majority of makes of artificial teeth we have to select from are not put up in the proper way. By that I mean that a set is all one color. There is no variation of shade or tint as regards the colors of the various teeth. It is a recognized fact that outside the white of the eyes of the normal individual, the upper central incisors form the lightest colored spot in the face, when the mouth is open. The central incisors are the lightest in color. Then the next, the lateral incisors should be a little darker. They should have the same colors the centrals have, the gingival being usually more opaque and more yellow, having a deeper shade. Then the cuspids are materially darker as a rule, though there is a blending or color from the central incisor to the lateral incisor and the cuspid, yet the cuspid is considerably darker than the other teeth, especially in its gingival portion. I think it was Dr. Royce who gave us the scheme that the bicuspids should be a little bit lighter than the cuspids; yet from what Dr. Clapp has written, the teeth should shade slightly darker from the cuspids back. With the lower incisors they have the same general color but a slightly deeper and darker shade than the uppers, and considerably more so with the lower cuspids than with the upper ones. So much then for the arrangement of the colors. From a practical standpoint it is a very good thing, in the average case, to mix colors. It is seldom—in fact I rarely ever, take even the newer sets of teeth as they come, without mixing the shades. I will select cuspids which are considerably darker than the centrals and laterals, or select bicuspids, one especially, which is considerably darker, mix the shades enough to break up that evenness, that monotony in color, because in the average mouth you find such conditions. In the average mouth having natural teeth at the present day you will find some teeth are more or less discolored because they are pulpless and filled; they may have spots on them, such as brownin or white spots, or there may be blemishes on them, all of which can be reproduced by mixing shades, the staining process, and by grinding and at times filling—things we ought to do in connection with our work if we want to get the natural color conditions and the most esthetic effects.

I do not know that there is anything else I can add. I want to leave something for my friend, Dr. Roach, to say, because there is so much that can be said on this subject.

I want to apologize again because I was not in a proper condition to discuss this paper in the way it should be discussed. However, I want to compliment the essayist on the high character of his paper from a scientific standpoint. It will stimulate us to study more and more, and if it does that it will do much good.

DR. F. E. ROACH:

This subject is one of unusual interest and importance to us as dentists. I think this is the first time we have ever had a paper on this subject that has been read before this society. We have had the subject of variation in colors of teeth, which has been brought to our notice very forcibly and nicely by Dr. Royce, and through his efforts we have endeavored to improve in our arrangement, from a color standpoint, in sets of artificial teeth. He brought to our notice that rarely do we find two teeth of the same color in one individual's mouth and because of this variation in color it becomes necessary for us in the restoration of these lost organs by means of artificial dentures to, as nearly as possible, simulate Nature's arrangement of these colors, so it is a subject to which we need to give a little more serious consideration. As prosthetic operators, we should try and keep abreast of the times, because we are going to have a lot of artificial sets of teeth to make very soon the way things are going at present. We will all be prosthetic dentists I am afraid; but regardless of whether we are making false sets or partial artificial dentures, crowns or restoration of parts of teeth, we must know this subject better than we have in the past.

In the operative department it is almost inexcusable today to put in a filling of any kind that can be detected at all. If our patients are getting fillings that are noticeable at all, we are put on the blacklist. Our patrons are becoming educated to the possibilities of prosthetic dentistry as well. It is up to us to lead in the matter and to take the initiative and not be forced into it. We must study this question more carefully and thoroughly than we have in the past. We cannot afford to put in artificial sets of teeth all of one color. We cannot very well send an order to the dental supply house and say, "Send me color number 9 or color number 10." We must not use these one-color sets, arrange them like a row of beads, say they look nice, and then send the patient away with the impression that we are satisfied. We must do better than that.

I will have to apologize to Dr. Prothero for not discussing his paper from the point that he has discussed the subject. In the first place, I am unable to discuss the paper from a real scientific viewpoint. And like Dr. Dittmar, I did not have an opportunity of seeing the paper until the last minute, although I do recognize the great value of the paper. I fully recognize that it has great merit. It contains food for thought. There is something in this paper for us to study and it calls our attention to the necessity in our study of going down to the bottom of this subject and getting some of the fundamental information that will be of benefit to us in the practical application of it. But my inherent nature is the practical application of things, and for that reason I like to jump into the practical side of the subject.

Dr. Prothero has been studying this subject for a good many years, but I really believe, notwithstanding the splendid work of Dr. Prothero, the best work on this subject has been done by Clapp of New York. He has given this subject more extensive study than any man we have in the profession, so far as I know, so you can well afford, those of you who have not read his article on the question, to take time to study his writings as well as what Dr. Prothero says tonight and what he has said in his book. I find that he has a lot of new material in his paper which he does not have in his book.

You will please pardon a personal allusion, but I have been a very close and diligent student of the practical means of making artificial sets of teeth look, well—look what to me are pretty by making them look as ugly as I can to have the patient accept them. This is plain, commonsense every day work, the application of this question to a knowledge of the selection and arrangement of artificial sets of teeth. Some of the best sets of teeth I have ever made were picked out of the junk box for the reason that I used a variety of colors, a variety of moulds, and set them up hurriedly without any effort at all at symmetrical arrangement. They looked so natural that when I made up the permanent set I could hardly get the patient to accept them because they did not look so well as those from the junk. There is a practical application to this thought, namely, let us study the patient, the condition of the lost part, and find out if we can improve the condition, particularly with reference to the loss of the teeth. How many patients come to us for a full upper and lower artificial denture that have lost a beautiful set of teeth, a reasonably nice set of teeth from a color point of view as well as from the point of view of the arrangement. Usually these patients have gone through a period of decayed teeth, irregularities, discolorations, fillings, and all kinds of contrasts and incongruities of arrangement and color, and to take those teeth out and put in a reasonably nice symmetrically arranged set of teeth of one color is almost unbelievable from a practical point of view because of the sudden transformation. Dr. Prothero speaks of contrast. He does not mean that you are not to put in several colors in the arrangement of the sets of teeth.

Of course, he means by that in a modified way. We would not put in a red tooth and blue tooth and green tooth, or anything of that kind, taking the primary or secondary colors. We should put in a good deal of contrast, as much as we can, if we want the teeth to look well. That is the practical application of what I gather from this subject. We then come to the subject of variation. Personally, while there is one manufacturer that has given us teeth of variation of color, very beautiful teeth from an anatomical standpoint and color point of view, yet they do not meet my requirements. I cannot find any of these teeth that will suit me. I like to do a little hand staining on them. I like to put more character and individuality into these teeth, making them a little brown or dark or white in certain respects. It adds to the cosmetic appearance very materially and it is easily done, so that I cannot hardly believe that anyone is justified in putting in a set of teeth without making these changes. You can take a set of teeth and in ten minutes time get the color scheme you want. If you do this work properly you will find the teeth will look a hundred per cent better than some of the teeth you see with their monotony of color which you get from the manufacturers. If you study and work along this line you will find a vast improvement will take place over what many of us are doing and have been doing in the past.

If there are sixteen dentists in this Society who are color blind, if we are going to live up to the requirements not only of prosthetic dentistry, but of artistic dentistry, meeting all the requirements of the future in this work, we will have to make an entrance requirement in our schools so that the dentist can be thoroughly tested as to the intelligent preparation and selection of colors. In other words, if he is color blind he cannot get in and ought not to be allowed to practice dentistry.

After what Dr. Prothero has said tonight I hope most of us will go home and study this subject, get what we can out of it, and make practical progress in the improvement of our cosmetic work. I like the word cosmetic rather than esthetic, which is frequently used, and also the word artistic. I think we as dentists are practicing cosmetics in the treatment of these teeth, in beautifying our patients. I believe in the use of the word cosmetics; it is a means of beautifying. That is what the word cosmetic means.

If we are making sets of teeth more beautiful, we are practicing cosmetics, and let us therefore improve in our cosmetics.

Dr. J. H. Prothero (closing):

I regret that one of the principle thoughts in mind in presenting this paper has been overlooked by the gentlemen who have discussed it tonight. The main thing is acquiring a knowledge of fundamental color harmony,—learning the A B C of the science.

The color functions of the eye were outlined because, by explaining the action of light on the retina, the formation of complementary colors can be more clearly understood.

The work covered by Dr. Clapp was not reviewed because his color analyses of the human teeth are quite full and complete and, as I presumed, well known. By reference to his charts it will be found that primary and secondary colors as well are displayed in the natural teeth in such manner as to present a pleasing and harmonious color scheme.

This paper has not been offered as a solution of the problem which has confronted the dental profession ever since tooth replacement has been attempted, but I have endeavored to show that far better results can be attained in the selection of teeth by a study of color harmony than is possible without such knowledge. I know this from personal experience for my first efforts were very crude compared with what I can now accomplish with some knowledge of the theory of harmony.

Furthermore, any one who is not color blind will be greatly benefited by some effort expended along these lines.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held February 1, 1916, with the President, Dr. P. J. Kester, in the chair.

Dr. R. I. Lewis read a paper entitled "Interpretation of the X-ray."

DISCUSSION.

Dr. Truman W. Brophy:

The presentation of a paper on this subject, in view of the criticism of the American dentist that is being so generally made by physicians who have little or no knowledge of dental pathology, is very timely. I have been more or less impressed with the condition known as darkened area in Röentgen photographs lately, not only from the work that Dr. Lewis has done for me, but on account of reviewing the work done by others some years ago. It was not until probably about four years ago that I was impressed with the mistakes I had made in reading X-ray pictures, and that was brought about in this way: I point this out because I am satisfied that a great many have made and perhaps are making the same mistakes that I did. At that time whenever I saw a darkened area around the root of a tooth, I assumed it meant the presence of an abscess, but when I made X-ray pictures of fracture of the mandible, and found a well defined line of fracture, and then made use of splints, readjusted the fragments, restored the normal occlusion of the teeth, waited six or eight weeks, and then made another skiagraph of the same bone at the same place, I found exactly the same appearance that I found when I had the first skiagraph made, and concluded before I learned better that a fracture still existed. The newly formed bone was not sufficiently dense in structure, not sufficiently ossified to present the same appearance that the normal bone did, so I was misled. Leaving the splints on for five or six weeks longer, again making an X-ray picture, I still found a well defined line at the fracture, but feeling satisfied that the bone was united, I removed the splints, and found the bone had firmly united and was all right, yet at that time it showed exactly the same condition that it did when the first skiagraph was made. This led me to believe that I had been making mistakes regarding the darkened areas of the ends of the roots of teeth. Now, I am of the opinion that these darkened areas we see on the plate are by no means evidence of an abscess. They are evidence, however, that an abscess once existed, that the bone was destroyed or absorbed by pressure, and that perhaps there was infection of the organic matter of the bone to such an extent that some of the bone itself became disintegrated. In some instances we all know a great deal of the bone will become disintegrated and large cavities will be left at the ends of the roots of the teeth; but these large cavities, everything being done to exclude further infection by having the root well filled, will be filled with new bone.

In this connection I would like to state that at the meeting of the Clinical Congress of Surgeons of North America, held in

Boston last fall, Dr. M. L. Rhein read a paper on this subject and presented by means of the stereopticon some plates showing teeth the roots of which were not well filled, with rather large areas of destruction at their apices. Then he showed the same teeth, skiagraphs of which were made two years later. He had removed the fillings from the roots of those teeth and refilled them, following which there was sclerosis, the bone was well developed, completely surrounding the end of the roots, showing as complete an alveolus as any of the teeth with living pulps. All we need in the treatment of such teeth is asepsis. We must have these roots thoroughly cleaned, sterilized and well filled. If so, the abscess cavity which is shown so clearly and readily in these plates will take care of itself. Sometimes we may be obliged to perforate and evacuate the fluid from it, but if the cavity can be thoroughly sterilized by treating the tooth root, or through the alveolar process, it will, if well drained, take care of itself. I have no more reason to believe that such a tooth should be extracted than I would believe a patient who had osteomyelitis of the radius or ulna should have his arm amputated. The principle is precisely the same, and if we can convince all our medical friends who are laboring so hard with this subject that disease of the character that has been presented here in these plates is amenable to successful treatment, and that the sacrifice of such teeth is not necessary, we will accomplish a great work.

The essayist has truly said that there has been and there still is a tendency to destroy everything that is not understood. He did not say that exactly, but that is what I say. If there is anything wrong, there is too much of a tendency to make a clean sweep of them all, and then the patient will unecessarily lose very important organs.

I want to congratulate the essayist on the presentation of his paper and plates. I am satisfied there is a whole lot more to learn with reference to the reading or interpretation of these plates. If a tooth is made firm by putting on bands and splints, after getting rid of the infection, such a tooth can be preserved and made to serve the purpose for which it was intended many, many years; but these Roentgen photographs are of inestimable value in the examination of teeth the alveoli of which have been almost wholly lost, and the teeth retained only be membranes. They stand in very shallow alveoli. They have so little support that they move with the slightest pressure. In these cases a skiagraph is of value in pointing out loss of bone and to convince us that it is absolutely necessary to remove the teeth or tooth, the alveolar processes of which have been destroyed by disease, notwithstanding what has been said by Dr. Hartzell, who claims that a new alveolar process may be developed with proper treatment. I would be loathe to accept that statement until I had seen at least half a dozen or a dozen positive demonstrations of that kind. We must have individual demonstrations to convince us that such a process does develop and grow under favorable conditions. There is so much to be said on the subject of skiagraphy, that I will not delay you longer, except to call attention to a specimen.

Here is a specimen in which one-third of the root of the tooth stands up in the antrum. That tooth is not in bone at the end of the root at all. If an abscess should form there, where do you suppose pus would escape? Into the antrum, of course. Our friends, the rhinologists, make great mistakes in overlooking this condition because at least seventy-five per cent of all infections of the antrum of Highmore come through the medium of diseased teeth rather than through the nose. The disease may come from nasal trouble and from the frontal sinus and ethnoid cells, but the teeth are more diseased than any other part, and when abscesses form about their roots, even the central incisor may involve the antrum by drifting back through the cancellated bony tissue. When this occurs a generous opening through the canine fossa should be made, in chronic cases, so that the antrum may be explored, an ocular examination made of all its walls, the diseased tissue removed, and the antrum restored to health without the loss of any tissue that would be detrimental to the patient.

Dr. Davis:

In making your incision you do not cut a flap, but remove a section of the gum tissue directly over the spot?

Dr. Brophy:

Certainly.

Dr. Davis:

Do you use a trephine?

Dr. Brophy:

Yes. I make a circular incision over the root I am going to cut off. A straight or crescent shaped incision will close up, so it is better to take out a button-shaped piece and make a funnel-shape from without in. When that is done the end of the root in the cavity can be removed and the cavity will gradually fill in at the base. When it comes out the outside will fill in and that will be the end of it. Instead of making an incision and a flap and sewing up the flap, we do as I have said. The granulations will fill up the hole very quickly; they will fill it up too rapidly, and it is well to let it granulate from the bottom. If a lineal incision be made it will promptly close and the cavity will not heal.

Dr. O. A. Strauss, Milwaukee, Wisconsin.

It gives me great pleasure to be here this evening, as I so much appreciate the importance of radiography, and its value, in dental pathology.

During the past two years I have had to treat many cases of rheumatism and arthritis in various forms, caused by infection—mostly by infections of the mouth.

About six months ago I had a patient who came to me with a bad arthritis deformans—he was barely able to walk for two years, and was practically unable to dress himself. The patient was a man of means, and was able to consult many prominent phycisions. He visited sanatoriums, Hot Springs, mud baths, etc.; in fact he tried everything to eliminate the uric acid condition. He came to Chicago, saw the most noted men of this city, and they were unable to find a focal infection; finally he came to me, and I examined him thoroughly—I found nothing; however, I started treating him, and looked again and again—I was rewarded by finding an infected pocket back of the third molar. An autogenous vaccine was made of this pocket, and after a few injections his hands cleared up. Then a pustule appeared in the left knee, which was badly infected. A specimen of the pus was taken from this pustule, and compared with the pus taken from the tooth pocket—they were both of the same type. The autogenous vaccine cleared up the condition in six weeks' time.

Last week I discharged a patient who did not walk for four years; she was a very heavy woman, weighing 215 pounds, and was about five feet, five inches tall. The patient had a blood pressure of 240. In this case radium was resorted to until the infection was found. I discovered in one of the infected joints, a little pus containing a pneumococcus fusiformis. For sometime I was unable to locate the infection, until finally I discovered through radiography that the lower anterior teeth were infected; autogenous vaccine was made of this, and very favorable results were obtained.

I cite these cases merely to demonstrate the importance of radiography in dentistry. These patients have been the rounds of both physicians and dentists. It also shows that one cannot depend alone upon the color of the tissues surrounding the teeth. Radiograms should be made for a positive result. On the other hand we must be very careful not to extract too freely, as pointed out by our friend, Dr. Brophy—simply because there is a slight discoloration in the radiograph. I have seen patients who were advised to have their teeth extracted—patients, with excellent teeth, and absolutely no pathological condition existing. Therefore, it is not only necessary to have radiographs made, but also to be able to interpret them properly.

Dr. George J. Dennis:

About the only thing I have to say is to offer a protest against the indiscriminate removal of teeth which is going on at the present time.

It has been my pleasure to see quite a number of skiagraphs of teeth that have been passed upon by physicians in which they distinctly stated the teeth should be removed. For some reason the skiagraphs were brought to me for interpretation, and after looking over them I do not hesitate to say that in about seventy-five per cent of the cases I could find very little, if anything, in these skiagraphs which would point to the necessity for the removal of those teeth.

I have in mind one case, a patient of one of the gentlemen present, in whom fifteen teeth were advised to be removed from the mouth of a man who was a little over forty years of age. Of those fifteen teeth, skiagraphs of which had been made, there were only four that I could say were at all suspicious. Of those four there was some doubt as to the necessity of their removal.

There is no doubt that focal infection has quite an important bearing upon the general physical condition of these patients. However, it seems to me, that it is a fad very largely that is being very much overdone, and I believe there will be a great reaction before long. Just how soon that reaction will occur I do not know. I think many of the men who have laid the greatest stress upon the subject of focal infections are beginning to see some of their failures, and there are quite a number of failures. There are so many points about the body besides the teeth and throat—and the throat, nose and ear interest me particularly—that the question comes up as to whether they have been successful in finding the real foci of infection. It is a thing I believe we ought to be conservative about, and yet there is no doubt about the truth of a great many of their findings. We all see, I think, remarkable recoveries of patients after the discovery of some focal infection and its removal. I have no doubt but what we will find many more if we are successful enough in looking for and finding them. I do not wish to be understood as belittling in any degree efforts in that direction; at the same time, I want to make a plea for a little more conservatism in reference to the extraction of teeth.

Dr. C. N. Johnson:

As a member of the Odontological Society, I want to express my appreciation to the essayist for presenting to us this subject at this time.

With regard to the subject of the paper, it is one which is probably more prominently before the profession just now than any other subject. It is a subject which we all need to study. Like all other innovations in medical or dental practice, it has been carried to an extreme, that is, with all the value attached to it, men have been led astray at times, and our chief function is to learn to interpret the X-ray picture, to study the features of it very carefully, and try not to make as many mistakes in the future as we have in the past on the basis of the evidence given by the X-ray.

I want to ask the essayist if I am correct when I make the statement that sometimes it is difficult to distinguish between a bone cavity at the end of the root of a tooth and the area in which there has been an asbcess, an abscess which has entirely healed up, and in which we may say the tissues are perfectly normal? I am positive that in many instances a diagnosis of bone cavity has been made and a tooth extracted when, if the man who extracted the tooth was absolutely honest, he would be obliged to say it was a normal tooth when he took it out. That is one of the evils concerning which we must be careful in reference to the interpretation of X-ray pictures.

Dr. Howard Raper has mentioned a case where he made a wrong diagnosis, but I do not know whether he has published the case or not, in a lower molar tooth which had been referred to him for an X-ray picture, and he reported back to the dentist who sent the patient to him that there was a pulp nodule in this tooth, and advised opening up of the tooth and destruction of the pulp. The dentist opened the tooth, destroyed the pulp, and reported back to Dr. Raper that there was no pulp nodule at all; that the pulp was in an absolutely normal condition. Dr. Raper said it was not possible because the X-ray did not lie, and asked that the patient be returned to him. On making a more careful examination he found an oxyphosphate of zinc filling in that tooth which he interpreted as a pulp nodule.

Those are the mistakes men make who are conscientious, and we must not jump at conclusions too readily, but study every case that presents itself to us. We must be broad-minded enough to look upon all sides of the question and never make a snap judgment, because as a result of this much injury has been done. In saying what I have said, I do not want to be understood as minimizing the value of the X-ray. It would be impossible, I believe, for us to do the service we can do for our patients today if we did not have the X-ray. It clears up many things for us, and the X-ray is not so much at fault as is our interpretation to it.

I would like to emphasize more and more the fact that the man who takes the X-ray pictures, and the man to whom these pictures are sent for interpretation, should be more careful in passing judgment too hurriedly. I want to make a suggestion that I think all men, who send patients for X-ray work, will coincide with, and this is: there should be a conference between the X-ray man and the dental practitioner in regard to every one of these cases.

I had a case some months ago in which I sent a patient to an X-ray man, and he reported to me that a certain tooth should be extracted, that there was an abscess which would not heal, as shown by the X-ray. This abscess yielded to treatment very readily. The sinus closed up at once, and the tooth is comfortable today, and I do not believe that I should have extracted that tooth on the statement of the X-ray man.

It is human for us to see things from our own point of view, and it is perfectly human for the X-ray man to say that diseases cannot be cured from the evidence furnished by the X-ray, although we may be able to cure some of them, and I believe these patients should be given the benefit of a doubt. We too frequently forget the patient's point of view, and we think too much of our own point of view and that of the X-ray man. If we had a tooth in our own mouth we valued very highly, we would not have it extracted without an attempt to save it. There should be a conference between the X-ray man who can point out many things we cannot see as dental practictioners, and that conference should be held solely on the basis of the welfare of the patient.

Dr. Albert G. Johnson:

I want to express my appreciation for your kindness in permitting me to meet with you tonight.

I wish to commend very highly Dr. Lewis' excellent paper. There are many cases one might cite from his general practice that give us an insight to the various phases of the X-ray. I really think that the principal interference that we are to meet from now on, and which we have had to contend with for some time in the past, unless it is stopped in some way, is that of the surgeon and physician in the dental line. The physician or surgeon attempts to interpret the X-ray, or after examining the oral cavity he suggests treatment. I will cite an instance in this connection.

A gentleman, fifty years of age, was in my office three months ago for whom I extracted an upper right first bicuspid, curetted the socket thoroughly, and found a great abundance of necrotic tissue there. I saw him again a month ago, at which time the cavity had healed completely. There was no inflammation in that vicinity. He was on his way to Hot Springs, and had just been in consultation with two eminent men in the city of Chicago, who suggested that he go to Hot Springs and take the water treatment, and, as he expressed it, "A bunch of medicine," which they gave him, in order that it might help to eliminate this poison from his body. In the course of an examination and questioning they learned he had had a severe abscess on the upper right side, and they criticized him very much for not informing them of this lesion in his mouth. He did not think it necessary for him to inform them for the simple reason the abscess had been cared for, the pocket had been curetted, and he socket healed. Upon that statement they insisted on an examiation of his mouth. Such an examination was made and the mouth ronounced absolutely normal. He came to my office to confirm heir diagnosis, thinking he would feel better if I said his mouth vas normal. This was about ten days before he left. Two or three nonths previously I had X-ray pictures taken, they were brought to ne and I read them to him. I gave him a mirror, took a probe, and laced it into a sinus over the upper left bicuspid and demonstrated o him a cavity there possibly the size of a pea. I could move the robe laterally. There was no tissue distal to it. There was a lower ight central, the alveolus of which was completely gone. I introluced the probe into that and showed it to him.

I mention this, one of many, cases to show you they are interfering in our field. Instead of giving us an opportunity to diagnose these cases and send them back to them, as is now becoming so largely the practice of the more intelligent members of the medical profession, they take it upon themselves to treat the cases. The injection of emetin has become chronic with them, and some of these professional gentlemen are even scaling. I know of one physician who is scaling teeth, and another who is putting borax and sugar into the pockets to dissolve calculus.

Dr. L. L. Davis:

There is so much that might be said on this subject, and so much I would like to say, that I hardly know where to begin.

I thoroughly agree with the essayist in regard to the position he takes with reference to the diagnosis of these cases and not mentioning it to the patient. He refuses to tell the patients anything about the diagnosis. There are a number of radiographers in Chicago who are very willing, just as soon as they have taken an X-ray picture of a case, to tell the patient what is to be done, and the patient in turn goes to the office of the dentist and tells him what the X-ray man has said must be done. Granting that some of these X-ray men may have a dental education, their experience in practical dentistry has not been sufficiently large to warrant them or justify them to say whether a tooth should be extracted or saved, and I think Dr. Lewis has taken the right position in refusing absolutely to discuss the case with the patient. But just as Dr. C. N. Johnson has said, I believe there should be a conference with the X-ray man and the dentist for the best interest of the patient regarding each case.

There is one thing to which I desire to call attention, and that is, on a number of occasions I have found it has been necessary to have an X-ray made, for instance, of an upper molar, and when the picture comes back you can see two roots perfectly well defined, but you cannot see the other one. One would naturally think the X-ray man, if one picture did not clearly disclose all three roots, would change his angle a little bit and give the dentist an opportunity to see what is wrong with the other one. Another thing: under those same conditions two roots may be clearly defined, but the third one is so faint that only an expert radiographer knows anything about it, and the dentist cannot see it at all. Under these circumstances I think it would be just as well, instead of losing time over a case of that kind, to have the radiographer take one more picture and with a little longer or shorter exposure in order to bring out that other root, if it is possible to do so. When you send a patient to have work of this kind done you try to learn all you possibly can about the case, and when the X-ray man takes another picture and tells you that the third root is there without your being able to see it, it is not very satisfactory either to the dentist or to the patient. Along that line I have had in mind the preparation of an article on the subject for some time. Such an article should be written from the standpoint of the dentist, and if we could get a man who was fitted to prepare a paper scientifically on this subject, it would be of great interest to this body of workers, not from the expert's side, but to show the expert wherein he failed to clear up things for the dentist. So that while a conference is the thing to be desired between the radiographer and dentist, yet I think the radiographer should take it upon himself to see that before these negatives are mailed to the dentist the whole area that he is to work on is clearly defined. If it is necessary to take three or even five pictures, it should be done, in order to give the dentist the chance to do the right thing by the patient, and I think Dr. C. N. Johnson aptly expressed that very clearly in his talk.

I have had an opportunity to observe two cases within the last month or so, one a case of Dr. Albert Johnson, and the other a case of Dr. Hinkins. Each case showed very little trouble with the roots. In Dr. Johnson's case it was a molar tooth, and in Dr. Hinkins' a central incisor. The X-ray pictures showed a very small darkened area. Upon the removal of the tooth an abscess was disclosed at least three-quarters of an inch long, and three-sixteenths of an inch in width. In fact, it was so large that an expert bacteriologist was enabled to make from twenty to forty sections of that one specimen. Dr. Johnson had a similar case from which sections were made and were studied. In this case it was a molar. A small darkened area was shown extending to the X-ray picture, and yet in either case the extent of the abscess was considerable, very much beyond the outlines given in the X-ray picture, and I would like to ask the essayist to explain that feature, if possible, because we are trying to learn to interpret these X-ray pictures.

Dr. F. E. Roach:

Regardless of the great value of the X-ray, we must not lose sight of the fallibility of men both in the interpretation and in taking the picture. We have to deal with the conditions that exist, and the mechanics in the operation of the machine, the knowing how to operate the machine to get the right picture, and then our interpretation of what we see in the picture. It is so easy to make mistakes, and as Dr. Johnson has said, it does seem to me, we cannot afford to be other than very careful and not jump at conclusions. If there is any question at all about the case, I want counsel with the man who took the picture. I feel that my patient is entitled to it; I feel I am entitled to it, and I feel I will be able to give my patient better service by reason of this, and if the case is one in which a physician has anything to do (and we have to do with a great many of these cases today), it is my duty to consult with the physician, and I feel, on the other hand, it is the physician's duty to consult with me. I am frank to say, it has been my good fortune in quite a few cases to consult with physicians, and as a rule they have referred the patients back to me, but with the recommendation they would like to have an opportunity to see the pictures and consult with me in reference to the case. I have found that as a rule.

I had one case some two years ago in which the physician sent the patient back to me, having had pictures taken himself, with instructions as to what he wanted me to do, and I rebelled, and I thought I was entitled to the position I took. He insisted on having a certain tooth extracted. It was an abutment for a splendid piece of bridgework. His diagnosis was pyorrhea, but any dentist would have known better. There was a shadow around the root on the skiagraph but no evidence of pyorrhea could be found on the tooth either before or after extraction. And I note the patient still has rheumatism. I think members of the medical profession will soon come to a realization of the mistakes they are making when these things are brought to their attention, and it is our duty to inform them that they are not in a position to interpret these X-ray pictures without the aid of the dentist, and I believe the time will come when they will not be so dictatorial.

Speaking of the ease with which we can make a mistake, I have in mind a case which came to my notice recently where a multi-rooted tooth, an upper molar, had been giving trouble. It was very sore. An X-ray picture was made, and apparently the roots were fairly well filled, but there was a little shadow in one of the roots, that showed very clearly there was a perforation of one of these roots. An opening had been made into one of the roots at an angle, so that the dentist in making a filling had run part the way off at an angle, leaving a projection of the filling which appeared to be sticking out on the other root. When the tooth was opened into that was the condition found to exist, and there was no perforation at all, yet you would swear there was a perforation of the root. That is an illustration of what may occur and what may look so clear and beautiful on the X-ray picture as being the condition present, does not exist at all, so that we cannot be too careful in the interpretation of these pictures.

I want to express my appreciation of Dr. Lewis' valuable paper. I appreciate the work he is doing, and I believe that a man who is doing this work with a knowledge of the dental side of it is in a position to serve us better than the man who has had no dental experience.

Dr. Sidney J. Knowles:

This is a subject in which I am very much interested, and I hope the age in which we are now living will see this radiographic work continue to be more thoroughly developed. While listening to the paper the thought occurred to me regarding the radiograph, that men are easily misled as to what the X-ray picture may show. In the near future I believe it will be established as a fact that the radiograph may be made more valuable by means of still further bearing out its findings, by another definite factor, as for instance, the blood count, or a picture which the blood may show. In other words, radiographs show darkened areas, and the point has been raised here tonight as to whether these darkened areas show the presence of infective material, or filled in healthy bone tissue cavity. I am hoping that possibly the picture presented with a definite blood analysis may help us to determine that point. The clinical findings, I believe, play just as important a part as the X-ray picture in the diagnosis. As I see it, from this day on, it will be the radiographs, the clinical findings, and the blood picture, and these three things in combination will enable us to more satisfactorily diagnose our cases, and not the clinical picture, radiographs or blood findings separately.

I have had X-ray pictures that have shown comparatively little trouble, and it has been a question whether I had a definite active pocket of infectious material to deal with. I have in mind a case where the radiograph showed very little trouble, simply a slightly darkened area around bifurcation of molar roots. A posted porcelain crown was taken off, and upon exploring I found there was a free flow of pus, and I decided to extract the tooth. The tooth when extracted was found to have a multiple formed abscess about a half an inch in diameter.

I am of the opinion that there is no way of taking a picture and saying this or that condition positively exists. There will be errors made in the interpretation of X-ray pictures, and in our diagnosis I believe we ought to have a combination of facts—the X-ray, the clinical findings, and the blood picture.

Dr. J. G. Reid:

I must confess, that I know very little about the subject of radiography. I have tried to find out something by using it, and I cannot say that I have been helped very many times. Sometimes I have, but the thing that impressed me at the clinic recently was the presentation of a case there that you have all seen. I have reference now to one of the surgical clinics I attended. The case is that of a young man, thirty-five years of age, who had an enormous abscesses on a lower molar tooth, and it had projected out onto the surface of the face where it had to be opened. The surgeon opened the abscess on the outside of the face at the time because it was necessary to do it. The surgeon looked at the X-ray picture, passed it around, and it did not show anything about that tooth that would indicate that this was an abscess. The surgeon said he would not take the X-ray picture as being correct, as he was satisfied the abscess came from the molar just the same. The impression I wish to convey is that the man who is not well informed about interpretating these X-ray pictures will be misled. After this tooth was extracted, the evidence was there that the abscess had come from that tooth, but so far as the X-ray picture itself was concerned, it showed nothing which would indicate that the abscess originated from that molar.

I have treated some cases without success. After I have dealt with an abscess two or three times and it does not heal, I begin to suspect that there is something else the matter. The trouble may be due to necrosed bone, to absorption of the root, and it is surprising in what a number of these cases we find the roots of the teeth are absorbed rather than there being a diseased area or a necrosed bone. I believe that is so from my experience, and I have had pictures taken to corroborate the condition, and in most of the cases I have found that to be largely true, namely, that when these cases do not heal (there are exceptions, of course), the trouble is with the root of the tooth itself being absorbed, or Nature is trying to throw it out. Some would say amputate the root; get rid of it. You know my opinion about the amputation of roots. I believe it is an unsuccessful operation so far as permanency is concerned. Temporary relief may be had by amputation of the roots of teeth, but eventually I believe that the excised root is hopeless.

The essayist very clearly defined in the early part of his paper the necessity of our familiarity with the pathological conditions of the mouth. I do not think we realize as much as we should the importance of that feature of our work. From my own experience, I should say that we need a great deal of training to read or interpret radiographic pictures, and a knowledge of pathological conditions is a very important element in the determination of what we see in and about diseased areas of teeth.

Cysts, I think, are very clearly defined by the X-ray. There is no mistaking them at any time. It has been stated here tonight that in two or three instances the dentist has not been able to see all the roots of teeth in the X-ray picture; that we do not see the shape of the upper molars. I would like to have a picture, if possible, when I am looking out for trouble, of those roots, and I do not have the opportunity always of seeing all of them.

The X-ray pictures of cases I have had have not been very satisfactory to me. They have left me almost as much in doubt as if I had not had them at all, and so like Dr. Knowles, I hope some of these days I will be able to see the things in the X-ray pictures that I would like to see and am looking for but am not able to see them now.

Dr. Truman W. Brophy:

This subject is an extremely important one before the profession today, and I want to add these few words to what I have already said: I accord to my medical confrere credit for everything that he knows. I realize that he knows a whole lot more about general conditions than we do. I am satisfied that if anyone here tonight were to direct a patient to an aurist, with instructions to him to open the martoid cells for the treatment of an empyema, he would consider it a bit of audacity that would be difficult to account for. If we were to direct a patient to a physician or surgeon, with instructions to amputate a finger or a leg, giving him orders to do so, or what we want done, he would be astonished at our audacity, and yet such a man will give orders to you to extract a tooth or teeth absolutely unconscious of the morbid condition with which they may be affected. Possibly they may not be diseased at all. I do not blame him for not knowing dental pathology because he has never had a chance in medical college to learn it. With few exceptions medical colleges do not teach dental pathology, and so we cannot reasonably expect a man to know what his college has not taught him. But we cannot reconcile ourselves to the condition that he is giving directions to perform an operation without knowing what is the matter. I know the average physician who sends a patient to a dentist with orders for him to extract teeth does not know what he is doing. He is sometimes responsible for irreparable injuries. He really does not know dental pathology in its simplest form. The average intern in a hospital, and he is one of the best men in the medical school or he would not be an intern, cannot tell the difference between sensitive dentine and an exposed pulp with pulpitis, a pericementitis, a dento-alveolar abscess, or dento-alveolar osteitis. He does not know the difference between these various conditions, to say nothing about the innumerable diseases to which the teeth are subject.

I would be glad to take before a medical society skiagraphs such as these, read them and give suggestions as to the treatment required. Why? To bring about health, normality, the prolonged usage of these important parts which too frequently are condemned to be lost forever. We all know that there is no possible way of restoring normal mastication, with all that the expression implies, by any kind of artificial devices.

DR. RALSTON I. LEWIS (closing):

In closing, I want to thank you for this kind invitation to appear before you this evening. Every time I have the opportunity to appear before a body of such men I always learn so much, that it makes me feel as if I were still a student. I realize the more we study, the more we have to learn, and it has certainly been a pleasure to me to be here, and I appreciate what you have said about my paper very much.

With regard to aseptic conditions under which root canals, etc., should be dealt with, I did not feel as if I should go into that phase of the subject in this paper, and I am afraid in the briefness of my paper I have allowed many things to go unsaid which should have been said to make myself clear along these lines. I am referring now to those cases which I have had under observation. I never cite a case until I have had at least one hundred similar cases, and since I have been engaged in this work I have tried to follow up, at least, that number of cases before I draw conclusions with reference to any of them, and then I feel I can back up anything I have said.

With regard to misunderstanding the interpretation of the X-ray pictures, I am the last person who would deny any information or refrain from telling dentists who sent me a case what the condition really was. The reason I speak of this is because so many men, when you try to interpret the picture for them, sometimes misunderstand you. Before I interpret a picture I want to know that I have the full co-operation of the doctor. I do not want him to think that I know something about it that he does not. It is simply a means to an end in diagnosing an X-ray film, and giving the findings to the dentist or doctor who sent the case.

With regard to the apices of some teeth projecting into the antrum, I will say, we oftentimes find a lingual root will show that it might be in the antrum. But this is misleading, due to the fact that the lingual root, as a general rule, passes lingually to the antrum of Highmore. Buccal roots do not often extend that high, and if you take a picture you will find the radiogram showing the buccal roots to be a great deal shorter than the lingual root. In order to get a good picture of any upper molar tooth it is necessary to direct the rays at near right angles. You must remember you have a concave surface lingually and consider that in reading the X-rays.

I am glad Dr. Strauss brought out the fact that autogenous vaccines are important in these cases, and I want to thank him personally for doing so because I believe a great deal of good can be obtained from the use of such vaccines. With regard to the remarks of Dr. Dennis with reference to focal infection, my experience along that line has been very limited, although I have been doing X-ray work for some of the nose and throat men in our building. I want to cite one case in particular in which a specialist removed the turbinates, washed out the antrum, took out the tonsils, and then had X-ray pictures taken of his teeth. Unfortunately, an upper third molar on the right side had never erupted. You will see a clearly defined abscessed condition in the picture I have here, and it stands to reason that this throat condition, which he could not cure, was due to the fact that a fistulous tract was emptying itself in the throat.

With regard to the bone cavity of which Dr. Johnson spoke, I do not believe I quite understood his question exactly.

DR. JOHNSON:

If you find a darkened area or shadow at the apex of the root of a tooth, are you able positively to determine whether that is an abscess, or whether it is a case that has been abscessed and filled in with other tissue?

DR. LEWIS:

That is not demonstrable with the X-ray machine alone. Someone spoke of pulp stones in cervical cavities. While I am on this subject, I will say that pulp stones in X-ray pictures will not give you a clear, definite outline. In those small cervical cavities which we often see in the X-ray pictures, and which are easily mistaken for pulp stones, you will notice that the pulp stone is not clearly defined. It will be blurred, but with an amalgam filling, a gutta percha or gold filling, you will find the X-ray will show it to be a clear-cut object. When a man gets an X-ray picture and he does not understand it, he should always co-operate with the skiagrapher and get a definite diagnosis.

Dr. Roach:

In case there is any question at all, you would be perfectly willing to make an examination of the mouth and give your opinion?

Dr. Lewis:

I would do that in the presence of the dentist. There is nothing I can add with regard to the abscess pocket in Dr. Johnson's case.

With reference to not seeing the three roots in a molar tooth on the X-ray picture, I will say that you can nearly always in the X-ray picture, if taken at a certain angle, find the lingual root immediately in between the two buccal roots. You follow the lingual root direct to the apex. You go down to the base of the tooth and start up on the buccal or lingual root. You will find the canal seems to go right out of the lingual root, but it does not. If you follow it in its course, it will bend back. To make this point clear, here is a tooth that came out. I have an X-ray of this tooth which I will pass around, and you will see how difficult it is to get good X-ray pictures.

A week ago last Saturday a man sent a case to me to be X-rayed. He is a very prominent man; he knew there was something there or he would not have sent the case. I worked over that case for an hour, trying to find out what was the matter. I want to say that I labored on that case until I was exhausted, and finally came to the conclusion that there was not any pathological condition associated with the teeth at that place. You can see how difficult it is to always produce good X-ray pictures of molar teeth. Dr. Davis spoke of the abscess being about three-quarters of an inch long by one-eighteenth of an inch in width. Do you remember how long the case had been going on?

Dr. Davis:

I do not know; it was Dr. Hinkins' case.

Dr. Lewis:

These cases do not manifest themselves in the early stages of abscess formation. You must get a cellular infiltration before the X-ray will demonstrate the condition, and it is therefore, essential to follow up these cases with X-ray pictures.

Dr. Davis:

In that particular case the X-ray picture showed it was an acute condition; the microscopic sections showed it was an acute condition, whereas, in Dr. Johnson's case, from which sections were taken at the same time, it was a chronic condition, and yet in each case the X-ray picture showed very little or no trouble at the end of the root, and in each case there was a large mass of pus and connective tissue.

Dr. Lewis:

There must have been a large abscess cavity. However, connective tissue will show itself clearly on the X-ray picture.

Dr. Davis:

But it did not show in either one of these cases.

Dr. Lewis:

This point is demonstrable in one of the cases in which the antrum was operated on, and there has been no trouble there for three years. If it were a new man and he got a picture like that, he would say it was the antrum, and it would not be at all. The condition has been cured and the patient has remained well. It is very essential to make a correct diagnosis from the X-ray picture, not from the X-ray man's standpoint alone, but from the clinical findings which I will cover when I discuss the remarks of Dr. Knowles.

Dr. Davis:

In one of the cases I spoke of it was a central incisor, and we get a fair chance of having a good picture of the root and of the condition beyond it, and yet the X-ray picture showed absolutely nothing. However, when the tooth was removed it showed that the abscess had nearly extended to the floor of the nose.

Dr. Lewis:

I cannot say exactly what that is.

Dr. Reid:

If pus is present in a cavity, does it give a light or dark shadow?

Dr. Lewis:

It is dark in the X-ray film, and light on the print. There is hardly one man out of twenty-five who will require a picture or print of these films.

In condemning teeth and stating whether they should be extracted or not, we are not in a position as yet to demonstrate that from the X-ray picture. Some of the boys connected with the Chicago Dental Research Club with whom I have talked about this subject a good deal say that a majority of the abscess cases that have been treated and cured do not show pathological conditions under the microscope. Therefore, with regard to the correct reading of the X-ray picture, the time has not yet arrived when it can be done in all cases. As Dr. Knowles has said, it requires the clinical findings, the blood-count, and a knowledge of the pathological conditions. It requires the use of the microscope, and a man should be able to read the pathological findings under the microscope before he can determine when a tooth or teeth should be extracted. I am in a position to know that in 85 per cent of the cases in which teeth have been extracted we have tested the blood and have always found an excessive amount of leucocytosis, ranging from 7,000, which is nearly normal, to 15,000. When other factors are eliminated, one is very easily led to believe that is the focal center of infection. I am speaking particularly now of rheumatic conditions.

I hope I have covered all of the points that have been brought out.

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EDITORIAL.

THE PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

This organization has been started with headquarters in Buffalo, N. Y., and it is worthy the consideration of all members of the profession. Its objects are so well stated by Dr. J. W. Beach, chairman of the committee of organization, in a recent letter to the editor that it is deemed best to reproduce it here.

Dr. Beach says:

"The Preparedness League of American Dentists is a new organization which is the outgrowth of present conditions at home and abroad. Its call for existence may be found in the laudable desire of the dental profession of the United States to put itself on record before the public by signifying its readiness to do its duty in its professional capacity by our government. Its slogan might well be: 'Of our profession, for our profession and our country if need be.'

"Its objects are, first of all, to register at the League headquarters the names of all dentists who will prepare the mouth of a worthy young man whose application for enlistment has been rejected because of oral conditions that will not meet army requirements. Nearly two thousand dentists, representing twenty states, have already been enrolled.

"Another object is to create a much greater number of oral and dental surgeons who will, if needed, be ready to treat post-battle cases requiring extensive restorations of teeth, jaws and face.

"This the league plans to accomplish by bringing together specialists whose work is interdependent, such as, for instance, the oral surgeon, the orthodontist, the prosthodontist, etc., and develop a standardized, or, at least, an accepted method of procedure in this particular field. Our profession will thereby be strengthened in its weakest part and the medical fraternity will then find it possible to co-operate with us on an equal basis.

"It is planned to establish section-units in different parts of the country, where clinics and instructions will be given members of the league who desire, forming what may be termed a series of study clubs, presided over by experienced men thoroughly equipped for this purpose.

> "The objects and principles are commendable and in consequence are worthy of the support of the dental profession. With our National Dental Association president, Thomas P. Hinman; Harvey J. Burkhart, a former president; Otto U. King, secretary, and Frank W. Low constituting the board of trustees, surely no better recommendation could be desired. J. W. Beach is chairman, H. A. Pullen vice-chairman, and M. B. Eshleman secretary-treasurer, with headquarters at 3 Professional building, Buffalo, N. Y."

With men of this type at the head, there is no doubt of the efficiency and success of the organization. The members of our profession need more self-sacrificing patriotism. The war in Europe has demonstrated the value of our services, and we should show to the world that we are willing to do our full share toward contributing to the common weal. Differences of opinion may exist as to the general theory of preparedness on the part of the United States, but no difference should be permitted as to the duty of dentists in case their services are needed. This movement is intended to show that the members of the dental profession are willing to sacrifice their own interests to aid the government. The present period is one of self-sacrific, and dentists should learn to take their full share. We commend this league to the consideration of the profession.

THE HASKELL DINNER.

On April 25, 1916, Dr. L. P. Haskell was tendered a dinner at the Chicago Athletic Club by a few of his friends, in honor of his ninetieth birthday. The event was an exceedingly pleasant one, made particularly so by the brightness, alertness and altogether "aliveness" of the guest of honor. Dr. Haskell never spoke more clearly or fluently than he did on that occasion, and the marvel is how he can carry off his ninety years so serenely. He made the statement that he never knew what it was to "take cold" and that for at least fifteen years he had never had an ache nor a pain. Readers of dental literature know how constantly he is writing for the profession on his specialty of prosthetic dentistry, and his mind seems as clear and active as a man half his age.

At the dinner everyone present had something to say in a delightful, informal way, paying tribute to the sterling qualities of this splendid man. Men were there who had known him nearly fifty years, and other who had known him only a few months; but all united in expressing their appreciation of his great worth to the profession, and his many lovable traits as a man. To Dr. Hart J. Goslee is due the credit for inaugurating the movement and carrying it through to a successful issue. It was not only a pleasant honor to Dr. Haskell, but it was a most delightful evening to his friends.

Straight down the serried ranks of time
  There marched a warrior bold;
Full ninety years of life sublime,
  Like patriarch of old.

And now the evening of his days,
  A mellow, western glow
Sheds benediction in its rays:—
  A friend without a foe.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

Cotton Holder:—A holder for cotton that is inconspicuous can be made by taking the plunger out of a hand pump for bicycles and fastening the barrel under the bracket table.—*E. T. Evans, Decatur, Ill.*

For Grinding Teeth:—A slight stream of water from a syringe over the tooth or stone while grinding a tooth hastens the operation and prevents pain, and is much better than dipping the stone in a glass of water occasionally, as many operators do.—*E. J. Perry, Washington, Iowa.*

Judging Amalgam for Fillings:—If you will take an occasional glance at the cavity or cavities that you are going to fill with amalgam while you are mixing the alloy, you may save time, and in the long run, money, by not mixing twice or three times as much as you want.—*R. J. Cruise, Chicago, Ill.*

Babbitt Metal for Dies:—In the case of babbitt metal, which has all the requisites of a dental die, do not use the common babbitt of commerce, such as is used for machinery, because in order to cheapen it, lead is used to some extent in place of tin, which ruins it for dental purposes.—*L. P. Haskell, Chicago, Ill.*

A Handy Polishing Cone:—Polishing cones can be made by running an inch or so of rubber tubing on the screw chuck of the lathe and winding on a few inches of bandage or a strip of any old rag, and moisten with your pumice mix, or whatever you want to use to polish.—*J. F. Nelson, Washington, Iowa.*

Wax Model Additions:—It is well to have in the case wax of two quite different colors. Sometimes you wish to build out an inlay model for additional contour, or better occlusion. If you make the addition with wax of a different color you can see exactly where and how much you add.—*Garrett Newkirk, Pasadena, Cal.*

Impacted Third Molars:—In the extraction of impacted third molars, or in other difficult extractions, where the patient prefers a general anesthetic, conductive anesthesia may be used with good results as a preliminary measure. A lighter degree of general anesthesia will be necessary and the shock will be lessened.—*A. E. Converse, Springfield, Ill.*

A Handy Broach Holder:—The German silver tubing, that may be secured of any jeweler under the name of joint wire, comes in 3-inch lengths and a little less than ⅛ inch in diameter. The broach is fastened in a moment with shellac by holding over flame, and may project much or little, as desired. The tubing may be used full length or cut very short. Its small size permits easy rotation; it is readily roughened for better grasp by drawing edge of file lengthwise a few times, and can be made distinguishable one from another by using pellets of sealing wax of various colors.—*J. T. Search, Onarga, Ill.*

Sloppy Amalgam:—Weigh your portions of alloy and mercury and do the first stages of the mixing by putting same into a rubber finger and mix thoroughly for one minute, then put the mass on a piece of coarse paper and complete the mixing, by drawing a heavy putty knife over the mass a number of times, which makes a very good plastic mass. Do not squeeze out the surplus mercury now, but pack into the cavity, using heavy hand pressure, with instruments which force the mercury to the surface and leave a very compact mass below the surface; surplus mercury is now scraped off with a thin instrument; repeat until the cavity is more than full and let rest for a few minutes, then restore normal occlusion by carving. Fill a large molar cavity in the laboratory, by this method, let rest for a day, then polish, and see the beautiful result.—*W. O. Fellman, Oak Park, Ill.*

Devitalization of Deciduous Teeth:—Every dentist is daily confronted with the perplexing problems of badly decayed deciduous teeth, in which, in a great number of cases, devitalization is the only alternative. Every modern dentist believes in preserving these teeth until the eruption of their successors. But the question arises how to quickly and painlessly accomplish this devitalization without overtaxing the little patient.

A method which is very successful is as follows: When devitalization becomes necessary, use mucous anesthesia. First, paint gum around tooth with iodin to promote asepsis, and see that all instruments are perfectly sterile. Then, with hypodermic syringe, using any good local anesthetic, inject in interproximal spaces on either side of tooth, carrying needle as near to apex of root as possible, and anesthetize the area around apices of the roots. Now, the pulp tissue can quickly and painlessly be removed. After checking hemorrhage, place a bland antiseptic dressing in canals for four to six days. The roots may then be filled and the permanent filling inserted. This method is very practical, due to the soft, cancellous nature of the process and the fact that the apices of the roots are large, thus allowing perfect anesthetization of the pulp tissue.—*Floyd E. Gibbin, Springville, N. Y.*

Advantages of 20K Plate:—Instead of using solder for the attachment of a cusp to the band in the construction of shell crowns, far better results can be obtained by soldering from the outside with 20K plate. This not only gives the crown stronger joints and a greater thickness of gold, but also eliminates the appearance of the solder line which is always noticeable after a few months of wear.

In adjusting the swedged cusp to the band, it frequently happens that the edge of the cusp at some point is slightly smaller, or perhaps larger, than the band. Now if the cusp is attached by the use of solder from the inside, as is usually done, subsequent polishing will not only frequently expose the solder, but also disturb the contour.

If, on the contrary, the crown is soldered from the outside with 20K plate, the cusp or band can readily be built flush. Moreover, the danger of exposing the solder in polishing is eliminated, and the contour is preserved to a far greater extent.

When shell crowns are used for bridge abutments, there is always a demand for greater strength. Again, this can readily be supplied by the sweating of 20K plate at the desired points; with the additional assurance of not disturbing the reinforced surface in the assembling of the bridge. While the use of 20K plate in perfecting shell crowns may probably consume a little more time than the ordinary methods employed, time is not the only factor to be considered, except perhaps by the dental laboratories, and the splendid results obtained will amply justify the operator.—*L. J. Huber, Ste. Genevieve, Mo.*

MEMORANDA.

UTAH STATE DENTAL SOCIETY.

The next annual meeting of this society will be held at the Hotel Utah, Salt Lake City, June 22 to 24, 1916.—E. C. Fairweather, Secretary, Boston, Building, Salt Lake City.

IDAHO STATE BOARD OF DENTAL EXAMINERS.

The next meeting of this board will be held in Boise, beginning Wednesday, June 28th, at 9 a. m., at the State Capitol.—Albert A. Jessup, D. D. S., Secretary, Box, 1414, Boise, Idaho.

NEW ORLEANS WANTS THE NATIONAL DENTAL ASSOCIATION IN 1918.

New Orleans will send a strong delegation to Louisville to invite the National Dental Association to hold its meeting there in 1918. The city in a circular presents its various advantages as a convention city and makes a strong plea for consideration.

THE NORTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The North Dakota Board of Dental Examiners will hold its next meeting in Fargo, July 11th, at 9 o'clock and will continue four days. All applications and credentials must be in the hands of the secretary July first. For application blanks and information address W. E. Hocking, Secretary, Devils Lake, N. D.

CALIFORNIA STATE DENTAL ASSOCIATION.

The forty-third session of the California State Dental Association will be held at the Palace hotel, San Francisco, July 12, 13, 14 and 15. We hope to make this an attractive meeting; men of national prominence have been secured. Our own members will present clinics on every subject of importance. A cordial invitation is extended to all who may be interested. Exhibitors wishing space may secure information from the secretary.—John E. Gurley, Secretary, 350 Post street, San Francisco.

PENNSYLVANIA STATE DENTAL SOCIETY.

The forty-eighth annual meeting of the Pennsylvania State Dental Society will be held in Carnegie Music Hall, Pittsburgh, Pa., June 27, 28 and 29, 1916. Special attention has been given to the selection of the essayists, who will give illustrated lectures upon very important subjects concerning the dental profession. Judging from reports of the various committees, this meeting promises to be well worthy your attention. A cordial invitation to be present is extended to all ethical practitioners.—J. F. Biddle, W. H. Haines, A. P. Lee, Program Committee.

CANADIAN DENTAL ASSOCIATION.

The next regular biennial meeting of the Canadian Dental Association will be held in Montreal on September 12, 13, 14, 15. A large number of Canadian dentists has gone to "do their bit" in the great European conflict. Others expect to go during the coming summer.

It is earnestly hoped by the executive committee that all those of our number who can do so will make a point of attending the coming meeting.

An excellent program is being prepared, and September is an ideal month in which to visit Montreal, Quebec and the mighty St. Lawrence. A cordial welcome will be extended to members of sister societies in the United States who can make it convenient to visit us at that time. For further particulars please address F. A. Stevenson, 154 Metcalfe street, Montreal, Quebec.

SAINT LOUIS DENTAL SOCIETY.

There is nothing the matter with dentistry in St. Louis.

St. Louis enjoys the distinction of having the oldest active dental society in the world and the oldest dental college in the West. In this environment many of the eminent men in our profession have developed. With pardonable pride in this record, the members of the St. Louis Dental Society are preparing to celebrate the sixtieth anniversary of its organization, November 16, 17 and 18, 1916.

A series of scientific papers along advanced lines of present interest will be presented by the foremost teachers and original investigators. Individual clinicians and group clinics by societies and study clubs are solicited to accurately delineate the modern progress of dentistry.

A selected exhibit of dental appliances, equipment, and reputable pharmaceutical preparations will be displayed, but anticipate obtaining something more valuable than a collection of samples.

You shall not be permitted to forget the date, November 16, 17 and 18, but plan to represent your society on this program.

CLINICS OF THE NATIONAL DENTAL ASSOCIATION.

The Clinic Committee of the National Dental Association has arranged for two half-day clinics, an Illustrated Lecture Clinic and a Progressive Clinic; and surgical clinics under conductive and general anesthesia for the annual meeting to be held in Louisville, Kentucky, July 25 to 28, 1916.

Illustrated Lecture Clinic, Wednesday, July 26, 1:30 p. m.—These clinics will be presented to the entire membership in attendance at Keith's Theatre, having a seating capacity of over 3,000 people. Time to be occupied by each clinician will vary from twenty to twenty-five minutes. Clinicians and subjects they will present are as follows: Dr. T. P. Hinman—Therapeutic treatment of pulp diseases when the vitality of the pulp cannot be retained, including the aseptic management of root canal treatment having special reference to sterile condition of outside of tooth, rubber dam and holder, broaches and cotton employed in the application of remedies, not including the opening up or gaining access to constricted canals. Dr. J. R. Callahan—The technic of root canal filling with rosin and the opening of small and constricted canals. Dr. R. Ottolengui—The technic of root canal filling with gutta percha preparations. Dr. J. D. Patterson—Indications and contraindications for treating teeth involved with pyorrhea alveolaris including statements having reference to the various suggested remedies, including emetin; discussion not to include the technic of instrumentation or the care of the tooth surfaces by the dentist or patient. Dr. W. A. Price—Oral infections with special reference to bacteriology. Dr. E. T. Tinker—Bridge abutments for votal teeth, with exhibition of radiographs showing condition of periapical tissues after the lapse of time. Dr. C. N. Johnson—Practice management, business investments and a dentist's duty to his profession.

Progressive Clinic, Friday, July 28, 9:15 a. m.—These clinics will be held in the balcony of the Armory, which is to be divided into twenty-four rooms, with seats arranged in amphitheatre form. The demonstrations will be given by members of the National Association residing in Michigan, Indiana, Kentucky and Tennessee. The thought back of the plan of confining the progressive clinicians to members of the National District in which Louisville is located is for the purpose of showing the profession at large the type of dentistry being accomplished in this particular section of the country. The subjects to be presented are as follows: Cement Clinic—All forms, the technic of mixing and insertion. Porcelain Clinic—Porcelain jacket crown, its indication and technic of construction. Radiography Clinic—Interpretation of dental radiographs. Local and Conductive Anesthesia Clinic—The technic of making novocain suprarenin solutions, the care of the syringe, needles, etc. The technic of injections of novocain suprarenin for local and conductive anesthesia. Removable Bridgework Clinic—Partial dentures and removable bridgework with description of the various forms of attachment, including the type indicated to engage vital teeth. Impression Taking in Modeling Compound Clinic—Taking impressions in modeling compound with the mouth closed and under normal biting stress. Full Denture Clinic—Full dentures, not including impression taking. Oral Surgery Clinic, Thursday, July 27, 10 a. m. to 12:30 a. m.—Operations under conductive and general anesthesia will be held in the City Hospital. Types of operations to be performed are as follows: Local and Conductive Anesthesia—Cavity preparation, pulp removal and extraction of teeth under novocain suprarenin anesthesia. Antrum operations and alcohol injections for trigeminal neuralgia under novocain suprarenin anesthesia. Removal of impacted inferior third molars under novocain suprarenin anesthesia. Root end amputation of teeth under novocain suprarenin anesthesia. General Anesthesia—Cleft palate, harelip, and such other cases as present. Committee: C. N. Hughes, H. B. Tileston, Wm. H. G. Logan, Chairman, 29 E. Madison Street, Chicago, Ill.

GENERAL PLAN FOR THE TWENTIETH ANNUAL SESSION OF THE NATIONAL DENTAL ASSOCIATION.

While no sensational changes are contemplated in the general plan of this annual session of the National to be held in Louisville, July 25, 26, 27 and 28, there are a number of decided improvements which will be inaugurated.

Outline and Location of Sessions.

The first day will begin with registering all members and guests, at the spacious First Regiment Armory rotunda. Such facilities will be provided as will make registration a pleasure. The ladies will register on the mezzanine floor of the Seelbach hotel, which will be their headquarters and from which all entertainments will start.

Opening session will be held in Keith's theater, seating over 3,000 very comfortably. This theater is artificially cooled to the temperature of 65 degrees during the summer months, and of its acoustic properties Dr. Thomas Hinman had this to say, after a recent inspection: "Nowhere, with the exception of the Mormon Temple at Salt Lake City, have I observed such wonderful acoustic properties."

All general sessions and some special sectional meetings will be held in this theater, which is diagonally across the street from registration headquarters, one block from Seelbach hotel and one-half block from the Watterson hotel and Hermitage hotel.

The splendid auditoriums of the Seelbach and Watterson hotels will be used for sectional meetings, as well as McCauley's theater, across the street from the Seelbach. Altogether there will be four sectional meetings in progress at the same time, so every phase of modern dentistry will be presented in the most approved manner.

Drs. Hinman, W. H. G. Logan, O. U. King and E. G. Link of Rochester, while on visits to Louisville, expressed surprise at the fortunate arrangements of buildings in which the sessions could be held, for all hotels and theaters which will be employed are within the radius or length of two (2) city blocks; going from east to west, from Fourth street on Walnut, they are McCauley's theater, Seelbach hotel, Henry Watterson hotel, Keith's theater and First Regiment Armory, where registration, exhibits and progressive clinics will be held.

Notable Clinics on Wednesday.

Perhaps the greatest treat the profession has every enjoyed will be provided on Wednesday afternoon, when, under the supervision and direction of Dr. W. H. G. Logan, four hours and one-half will be devoted to "Illustrated Lecture Clinics," presented by men of acknowledged authority upon the subjects on which they are to speak.

This is a new feature of a National meeting and affords every member in attendance an equal opportunity to hear and see the same good clinics, and when the profession is assured that Dr. Logan has complete charge of this branch of the meeting, it warrants us to expect something out of the ordinary.

More Clinics on Friday Morning.

The great balcony of the First Regiment Armory will be divided into twenty-seven sections, each to seat from one hundred and twenty-five to one hundred and fifty members and visitors. There will be twenty-seven clinicians, divided into three branches of dentistry, and the outline is so arranged that every man, by remaining in his seat, will see every one of the twenty-seven clinics in the morning allotted for this branch of the work. Much thought and careful study has been devoted to this work and it should be a strong feature in attracting the members of the National to this meeting.

Another Attractive Feature.

A feature of special interest to many members of the National will be the joint meeting of the Inter-State Anesthetists, a strong body of both medical and dental men having special interest in anesthesia. A strong program for a joint meeting has been arranged, including the following men: Drs. Long, McMillian, Denman, Brophy, Riethmueller, Thoma and Yager, who will discuss the following subjects: "Oral Operations under Nitrous Oxide-Oxygen in the Forward-Inclined Sitting Posture," "Vapor Anesthesia for Oral Surgery," "Intro-Oral Methods of Local Anesthesia," "Extra-Oral Methods of Local Anesthesia," "Handling Emergencies under Anesthesia and Analgesia in the Dentist's Office." After this session, which takes place on Wednesday at McCauley's theater, this organization will hold a three days' session in the Red Room of the Seelbach, to which all dentists interested in this useful branch of our healing art are invited.

Something About Accommodations.

From some source the expression of fear has reached the local committee on arrangements that Louisville did not have accommodations for a large meeting. To all such fearing friends we submit the following queries:

DO YOU KNOW that Louisville has sixteen splendid hotels, with a total of 3,000 rooms, not to mention the score of lesser hotels for those who prefer to live modestly?

DO YOU KNOW that Louisville's Y. M. C. A., Y. W. C. A., Y. M. H. A. can furnish quarters for hundreds of tourists who prefer that kind of accommodation?

DO YOU KNOW that Louisville has entertained some of the largest conventions in the country in a most acceptable manner, notable among them the International Sunday School Association, with eight thousand registered delegates; the National Canners, with from three to four thousand delegates, have met in Louisville for three consecutive years in preference to other larger competing cities; the great "Saengerfest," which brought thousands to Louisville; Knight Templars, Shriners and a host of the largest gatherings of commercial, political or religious nature in America. This she would be unable to do were it not for her extensive hotel accommodations and genial southern Kentucky brand of hospitality.

"You'll Feel at Home in Louisville."

This slogan is ever in the mind of the entertainment committee which is charged with the special responsibility of making every visitor to this convention feel perfectly at home. While this committee is planning to work in harmony with the wishes of the officers of the National, in that no special entertainment will be furnished the male attendants, because of the valuable time it consumes from the regular program, yet they will leave nothing undone to take care of the comforts of all who attend the meeting. Perhaps the greatest service they will render the dentist will be to thoroughly entertain the ladies!

A series of entertainments is being arranged for, with the assistance of a ladies' committee, composed of the wife of each local committeeman, which will so completely take up the time of visiting ladies that their husbands will be relieved entirely of the responsibility of providing entertainment. The word comes from this committee, "Tell the boys to bring the ladies and we will take good care ofthem in true Kentucky style."

Among the entertainments for the ladies are the following: Sight-seeing auto trip with luncheon at the Country Club; boat ride upon the beautiful Ohio river; shopping tour through Louisville's handsome department stores; trip to Fountain Ferry Park, with theater party and lunch, and others.

"You'll feel at home in Louisville."

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DENTAL EDUCATION.*

BY TRUMAN W. BROPHY, M. D., D. D. S., LL. D., SC. D., F. A. C. S.

Since the first institution of dental learning was organized in the United States, in Baltimore in 1839, the subject of dental education has been foremost in the minds of all progressive dentists.

The founder, Chapin A. Harris, a medical man, did his utmost to enlist the co-operation of his confreres in making dentistry a department of medical teaching. They positively refused to so admit it. It was necessary, therefore, to establish an independent dental college.

There are medical teachers at the present time who are quite anxious to include dentistry as a part of the medical curriculum. The medical colleges of the better class have extended their course of instruction over a period of five years, and this course does not include the teaching of dental pathology; dental physiology and anatomy—neither human nor comparative—dental materia medica and therapeutics; little or nothing of dental histology; and nothing pertaining to the principles and practice of dentistry in all its various departments. The course, then, to include the dental and medical courses would embrace a period of study extending over eight years. This, too, without the student having any hospital interne work which is so essential to a knowledge of medicine. It is quite apparent that this long period of study is not likely to be adopted for many years to come, if ever.

In reviewing the past, it will be found that the teachers of the dental colleges have been able, earnest workers in advancing the highest and best interests of the profession, in equipping young men to engage in its practice. They have not only been great teachers but they have been among the most liberal contributors to the literature of the profession.

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*Read before the Associated Dental Faculties of Chicago, March 31, 1916.

While the progress made by dental college teachers in the early days was handicapped by the want of concert of action and association work, many eminent men were graduated and have filled important places, not only at home but abroad. Among the early graduates who distinguished themselves abroad, were Evans of Paris, Sylvester of Berlin, Jenkins of Dresden and Thomas of Vienna; while at home, Allport of Chicago, Maynard of Washington, Spalding and Eames of St. Louis, Truman of Philadelphia, Lord, Parmalee and Dwinell of New York, Weatherby of Boston, Taylor of Cincinnati, Morgan of Nashville, Walker of New Orleans and Taft and Watt of Ohio speak well for the character of the teaching of the early college professors.

It was not until the organization of the National Association of Dental Faculties in 1884 that the colleges began to develop and rapidly enlarge the curriculum, making the course of study more efficient. The National Association of Dental Faculties has exerted a tremendous influence in upbuilding the dental educational institutions of this country.

It will be remembered by the older members of the profession here present, that the standard for admission to dental colleges, prior to the organization of this Association, was whatever the individual college faculties pleased, which practically meant no standard.

In the meeting of the Association held in 1897, Dr. M. W. Foster introduced a resolution calling for a certificate of entrance to a high school as the minimum requirement for preliminary education, and this resolution was adopted.

In 1889 a resolution was adopted, placing the minimum requirement for admission at one year's work in a high school and a certificate of entrance into the second.

In 1900, a resolution calling for a certificate of entrance to the third year of high school work was passed as the requirement for admission. It is a matter of record that I myself offered the resolution calling for high school graduation before admission to our schools, in the National Association in 1902, and from that time on, though it was deferred from year to year, until adopted, in which effort I was joined by Doctor Koch. In the meantime, the

Chicago colleges resolved to adopt it, regardless of the action of the Association. This retrospect is for the purpose of showing that the Chicago schools have always been in the vanguard of professional advancement. I am still of the opinion that the preliminary educational qualifications of our students should be advanced.

Immediately before the vote on the resolution calling for high school graduation, in the session of 1903, I made the following remarks:

"What the result of the vote upon this resolution will be, I do now know, but I am convinced that every member of this Association sees the importance of carrying the preliminary education of our students up to the standard we propose. We are educating our students to be professional men. We need men who have had opportunities for securing a knowledge of the languages and sciences such as are given in the high schools. It is true that there is no fixed standard for high schools up to which every school comes, but is there any gentleman here who can say truthfully that there is a fixed standard among other institutions—academies, colleges and universities? There is no standard in the universities of this or any other country which you may say is uniform. They deviate just as much in standards as the institutions of this Association differ in the requirement of branches taught, and so we have no standard either.

"It is my intention in offering this resolution to call for a full four years' course in a high grade high school, and the verbiage of this resolution is precisely the same, differing only in the words 'high school graduation' from that which we are now working under, calling for the completion of two years of high school work, and if you will refer to the resolution which we adopted calling for two years' high school work, you will see that the wording is the same except for that one change.

* * * * * * * *

"I just want to refer to a little history of this body. You will remember that at Saratoga Springs we had present with us a member of the Board of Regents of the University of the State of New York, and we adopted there this very simple and not complicated system of advancement by counts. When we went to Old Point Comfort, the president, Doctor Gray, ruled that the vote was out of order, the decision of the chair was appealed from, and when it came to a vote, we were left without any qualifications whatever for admission to our schools, and we had no preliminary standard of education. The outcome was that immediately the colleges of this Association were precipitated into a controversy with the State Board of Dental Examiners of the various states. I am very glad indeed, however, to say that Harvard University now has changed from her course then. Here we are today, back to the position we were at Saratoga Springs, calling for the count system, which is the only true and reliable system on which to base the preliminary qualifications."

The resolution was laid on the table by a vote of 34 to 5.

In 1907, a resolution was unanimously adopted by the Association extending the preliminary requirements to three years' work in a high school.

It was not until eight years ago, 1908, that we succeeded in securing the passage of a resolution calling for graduation from an accredited high school or its equivalent.

While we have now adopted a standard of graduation from an accredited high school, we are not satisfied with the educational requirements of our matriculates. We find that the preliminary education of many of them is very defective. It was assumed that a graduate from an accredited high school was qualified to enter our colleges, for such a student could enter a university and be placed in the freshman class. When many of them appear before the examiner for entrance into college work, or to obtain teachers' certificates, we find that they fail to pass; their knowledge is disappointing. If the high school graduates are not better qualified in the future, their diplomas will have to be refused by the colleges and a board of examiners will have to conduct the examinations. In our own state, those who have passed the examinations conducted by Mr. Downey, Deputy State Superintendent of Public Instruction, have proven to be a better prepared class of students than the high school graduates.

The character of the course of study in our colleges and the length of time to be required of students in completing it, have likewise been subject to constant discussion and change, in an effort to better prepare our students for their professional work.

In 1901, the following resolution was passed:

"Attendance upon four full courses of not less than seven months each in separate academic years shall be required before examination for graduation, for all students matriculating after the session of 1903."

Following the adoption of the four years' course, Dr. Taft moved that a committee of three be appointed to formulate for the guidance of the colleges which were members of the Association, a curriculum for the new course of instruction. The motion was referred to the Committee on Curriculum, of which Dr. N. S. Hoff was chairman, and the report of that Committee was adopted in the session of 1902, as follows:

CURRICULUM FOR FOUR YEARS' COURSE—28 WEEKS OR 1,000 WORKING HOURS.

Adopted in 1902.

First Year—		Lectures	Lab. Hrs.	Total Hrs.
General Physics	Laws of solids, liquids, gases, heat, light, electricity..............	26		
Chemistry	a. Chemical Physics	26		
	b. Inorganic elements and their compounds	52		
	c. Qualitative Analysis		120	
	d. Dental Metallurgy		60	
Anatomy	a. Embryology and Histology Lectures	26		
	b. Embryology and Histology Laboratory		120	
	c. Comparative and Descriptive Odontology	26		
	d. Drawing, Modeling and Carving Teeth		120	
Mechanical Technics	Tool making, Plate Technics.....		360	
		156	780	936
Second Year—				
Chemistry	Organic Elements and Their Compounds	52		
Anatomy	a. General Descriptive.............	78		
	b. Dissection		120	
Physiology	a. General Descriptive	78		
	b. Physiological Chemistry.........	52		
Prosthetic Dentistry	a. Plate Materials and Construction	26		
	b. Crown and Bridge Construction..	26		
	c. Crown and Bridge Technics.....		120	

Operative Dentistry	a. Materials and Cavity Preparation	26		
	b. Operative Technics		120	
	c. Introductory Clinical Work		120	
		338	480	818
Third Year—				
Bacteriology	a. Lectures	26		
	b. Laboratory		120	
Pharmacology	Materia Medica and Therapeutics	52		
Dental Surgery	a. Pathology	26		
	b. Etiology and Treatment	26		
Orthodontia	a. Principles and Methods	26		
	b. Technics and Clinic		120	
Prosthetic Dentistry	a. Art and Principles	26		
	b. Clinic		120	
Operative Dentistry	a. Principles and Practice	26		
	b. Clinic		360	
		208	720	928
Fourth Year—				
Principles of Practice	Ethics, Business Methods, Jurisprudence, Professional Duties and Fraternal Relations	26		
Orthodontia	Advanced work in Clinic (Optional)		120	
Procelain Art	Inlays, Crowns, Bridges, Plates	26		
Oral Surgery	a. Principles, Anatomy, Pathology, Diagnosis	52		
	b. Experimental and Pathological Laboratory		120	
	c. Technics of Bandaging, Splints, Obturation		120	
Therapeutics	a. Principles and Practice	52		
	b. Electro-Therapeutics, X-Ray, Cataphoresis		120	
	c. Clinic, Operative Dentistry, Treatments, Hospital		240	
Special Topics	Clinical Lectures and Demonstrations of New Things		120	
Thesis	Research Work (Optional)	..	..	
		156	840	996

It will be seen by this report, made fourteen years ago, that a great deal of thought was bestowed upon it, and I am of the opinion that it would be difficult to very greatly improve upon the details now.

At the meeting of the Association at Asheville, N. C., in 1903, the first institution to declare that it was not in favor of extending its course to four years, was Harvard University. This school declined to extend its course on the ground "That a still higher preliminary requirement is of greater importance to the students of the profession than an additional year to the schools. We deem it advisable to devote our energies in that direction." No doubt the preliminary qualification was too low in all the colleges and the time for professional training too short.

The regular meeting of the Association for 1904 convened at Washington, D. C., June 9th. It was found that a great deal of dissatisfaction existed by reason of the adoption of the four years' course in 1902, which was to go into effect the next session.

In July, 1904, the Association held a special meeting in St. Louis, and my remarks at that meeting, as I find them recorded in the Transactions, explain the object of the extra session:

"After my return from Washington—in fact, while at Washington, I had a conference with some of the older members and they expressed the opinion that unless something were done in regard to this matter of time, there would be trouble. But this was not considered of sufficient importance to be taken up. Then, hearing that several schools had resigned, we had a conference in Chicago, and our friend Dr. Black also thought that something ought to be done. I told Dr. Black that there was no way in the world to save this association but to get it together here. It is a matter of too much importance to the dental profession of this country to permit this association to become disintegrated, and the rules governing the requirements for graduation of students—the time spent by students before they are permitted to graduate—are of such importance that I believe if this body had not been brought together at the time, the meeting at Washington would have been the last meeting under our present rules. So I am glad to know that the members have considered it important enough to come here and take up this question. We have just a constitutional quorum here today. I hope we may be able to adopt a plan to hold the association together. I have talked to a number of men engaged in higher educational work who have given me their opinion as to the best thing for us to do, and they expressed this unanimously in favor of a course that shall be so long, whether the student complete that course in a certain number of years or not. I hope that every member here feels so interested in the perpetuation of this magnificent body that he will do what he can in this matter."

While a number of the schools of the Association had resigned on the ground that they could not extend the course over a period of four years, their resignations had not been accepted, the officers hoping that the integrity of the association might be preserved.

As a result of the deliberations in St. Louis, for the four years' course of six months each, was substituted a course of three years of thirty weeks, of six days each week, exclusive of holidays, as follows:

"Resolved, That the minimum time for dental teaching required by this Association to qualify students for examination for graduation shall be thirty weeks of six days each, in each of three separate academic years, exclusive of holidays, this resolution to take effect at once."

So the effort to establish a four years' course was defeated. The three years' course has been in operation ever since.

At the conclusion of the work of the meeting in St. Louis, I took occasion to make the following statement:

"By your act this afternoon the course has been changed to three years of practically eight months each. I wish that by some act of ours we could do something to advance the standard, but we are not called together for that purpose. I feel that by the adoption of a count system (and that will come up at the next annual meeting) we will show to the world that we are anxious to receive only well educated young men, and we will demand the completion of the high school course.

"I desire particularly to have that resolution go out to the profession with the work that has been done here today so as to show that we are making an advance in educational work."

The three dental colleges of Chicago, at a conference held on January 21, 1905, agreed "That a course of three years of thirty-two weeks in each year and six days in each week, should be established; and that the preliminary educational qualifications should be raised, beginning with 1907-8, to graduation from a high school having a four years' course of instruction, or its equivalent, which may be determined on the count system."

The Chicago Colleges, therefore, decided upon a longer course and higher entrance qualifications than the National Association of Dental Faculties had provided for. The Association adopted a similar resolution with regard to length of term in 1908, and it took effect in 1910. Our efforts to secure a thirty-two weeks' course instead of thirty weeks had met with failure in the National Association, but believing it was right, we decided to adopt it.

The preliminary requirements, according to the standard of the Board of Regents of the University of the State of New York in 1902, were as follows:

England	24 counts
Germany—Gymnasium	48 counts
Austria	48 counts
France	36 counts

In 1915, a resolution was adopted by the National Association, extending the course to include four years of thirty-two weeks each, the fourth ballot deciding the time when the new course was to begin as 1917-18. This time was fixed because it was regarded important to notify the schools and to give the profession timely notice so that they might prepare the students to enter upon the longer course. It is expected that the resolution will be faithfully carried out, unless certain measures which have been suggested regarding the curriculum, bring about its defeat.

The adoption of this course of four years is necessary to enable the student to properly comprehend the studies of the ever-expanding curriculum. In the language of our most eminent teachers, of world-wide fame, among whom were the late professors James Truman, G. V. Black, F. D. Weisse, J. B. Willmott, Jonathan Taft, H. A. Smith, and others, the lengthening of the course is necessary for the rounding out of the work essential for the proper preparation of the student for practice. The fourth year should be in large part along the lines of the work of the hospital intern; the student should take up the difficult things—he should have opportunity for research work in pathological, bateriological and technical laboratories; and devote not a small amount of time to the work included in the all-round duties of the dental practitioner.

As president of the International Dental Federation, I wish to state that its Commission of Education formulated a course of instruction some years ago, based upon a broad, general education which the students must have before entering the professional schools. Failing to meet the educational requirements, they were barred from entrance.

The National Dental Association of the United States is a component part of the International Federation. Through some misunderstanding of the functions of this great international body, Americans often speak of it as a foreign organization, as an organization outside and beyond the sphere of American dentistry and dental educational institutions. These views are probably due to the fact that the greater number of its meetings are held in Europe. While this Federation by no means assumes to dictate, yet, as it is an advisory body, it does exert a great influence in international dental affairs. The teachers of our country might profit by reading the transactions of that body, whose membership includes dental college professors from all countries of the world.

The colleges of this country have at last consented to conform to the four years' prescribed course of study adopted by the International Commission of Education many years ago. American colleges have announced that a four years' course in dentistry has been adopted. While this has been done, certain institutions propose to devote a part of this time to the work which belongs to the regular academic course of study.

This course, of thirty-two weeks each year for four years, was adopted as a course in professional study, as every one knows, and no fractional part of that four years can, in good faith, be devoted to non-professional work. The study of English, Syntax, Rhetoric, etc., essential as they are in professional study, are premedical and pre-dental studies, and under our rules and in conformance to the highest and best interests of professional education, a knowledge of these branches must be acquired before a student is permitted to matriculate. The high school course, according to the prospectus, is complete; but the graduates in many instances have not qualified in the branches taught. Our prospective students must therefore, appear before competent examiners who will be responsible for their educational qualifications for entrance into our colleges.

If it transpires in the near future that we cannot get the high schools of this country to train men so they will be fitted to enter our professional schools, then it will be necessary to do their work; but I am of the opinion that it will be far better for us, in case the applicants for matriculation fail to show their qualifications, far better to send them back to school instead of undertaking to prepare them for entrance ourselves.

The dental college is chartered by the state to teach dentistry and the allied sciences. The domain of a dental college is therefore well defined. The preparation for entrance to these colleges is not a part of dental college work. It comes strictly within the scope of general education. It is a part of the great foundation which should be laid in the building of the pyramid which stands for professional education.

Under conditions which seem to exist at the present time, if the high school qualification is inadequate to meet our requirements it becomes our duty to inform the leaders in general education of this deficiency, and if the information is imparted in a kindly spirit, as it should be, I am sure the defects in preliminary training will be corrected as promptly as possible, and that it will not become necessary for the dental schools to include in their curricula English and other branches which are a part of the school system. It would certainly be a great advantage if we could have a spelling school and teach the students how to spell better, but I doubt whether any one would regard such a procedure seriously.

The dental course of instruction should include only professional studies. I am satisfied that a great improvement could be made in conducting debates at suitable times, on profesional topics. I am further satisfied that great benefit to the student would result from more frequent recitation. The student should more faithfully study his text book, and the quiz master should quiz a class sufficiently small to enable every one to recite. The best results in dental education are by no means dependent on the work of the student alone. One of the greatest difficulties of the past, and this is shared in to a considerable extent at present, was the unpreparedness of the dental college teacher.

It is quite safe to say that few teachers in dental colleges, years ago, were well prepared to engage in that work. Many of them entered upon it reluctantly. They did so because it was necessary that some one should do the work, and it was not always possible for the best qualified men to take up the tasks of dental teaching. Sometimes those by no means qualified, by dint of hard work, succeeded very well.

It may be said that teachers are born, not made. The great qualities of a teacher come as an endowment; they are seldom acquired. A great responsibility rests upon a teacher, and a great responsibility rests upon a faculty having in charge the filling of teachers' positions. Young men of marked ability often do not wish to be teachers. A large and lucrative practice is their aim, and such allurements draw them from college work. Every college faculty should study carefully the students with a view to securing the most competent men to take the lower positions, eventually to advance into more important places in college work. The moral, mental and manly qualities should be measured. Does the young man show, by his application to his college work, a desire to study? Does he excell in any special field of work? Is he faithful in the performance of his duties as a student? Is he ambitious? Has he ability to clearly express his views? If so, he has in him the desirable qualities of a teacher.

I am of the opinion that every college professor should have one or two, probably three, men in his department who could, in the event of sickness, absence, or any emergency, take his place and do his work well, whether clinical or didactical. In order to do this, a professor should have one or two understudies. If this were done, a college would never suffer severely by the vacancy of a chair through death or resignation.

At a meeting of the International Dental Federation in London, August, 1914, a paper was read by Prof. W. Guy, Dean of the Edinburg Dental School. Dr. Guy, as Chairman of the Sub-Committee on Pedagogic Methods, said:

"Teachers will welcome the opportunity of learning something of the practice of others, and will in many cases make use of the information thus gained.

UNIFORMITY.

"Any attempt to introduce anything approaching uniformity of methods is doomed to failure. Suggestion is permissible, perhaps imperative. Dictation is mischievous and unthinkable. The details in any course vary with national character, *genius loci,* and personality of the teacher. Certain general principles must, however, govern any rational pedagogic methods, and these principles must be common to all countries and teachers. The aim of dental education is to teach the student to do certain things for the help or comfort of his fellow man.

PRELIMINARY AND GENERAL EDUCATION.

"Now in order that the student may do these things he must have (1) A good general education, so that he may not stand on a lower intellectual plane than his patient, and may be able to follow and digest the literature of his profession. (2) A special education in natural science (chemistry, physics and biology) as without this knowledge he cannot comprehend, or attempt to comprehend, the rest of the curriculum. (3) Instruction in anatomy and physiology; without accurate knowledge of these, further study is vain. (4) Comprehensive and exhaustive instruction in which we may group together as the special dental subjects. (5) As intimate a knowledge of theoretical and practical medicine, surgery, pathology and therapeutics as he is capable of acquiring and assimilating. (6) Such a degree of mechanical dexterity and facility in operative technique as will enable him to undertake with confidence and success any of the mechanical or operative procedures incidental to the practice of his profession.

TECHNIQUE METHOD.

"No. 6, for the sake of brevity, may in this report be called 'manual training,' with the proviso that it means a great deal more than the training of the hand. It means the education of the individual to such a point that whatever his mind, founded on accurate observation, scientific knowledge and experience, conceives to be the best procedure in any given conditions, his hand can perform with skill and surety. Unless the work of his hands is governed and dictated by the working of his brain, his labor is in vain.

"Therefore it is impossible to disassociate scientific training from manual training in dental education. Each is the complement of the other. It is permissible to doubt the value of any education which teaches men to know things, without at the same time teaching them to do things. So. too, it is certain that in dentistry men must learn and know many things, if they wish to do any one thing rightly. No mechanical or operative instructor should dare to teach, unless he can give the student a truly scientific reason for each step of the process or operation he is teaching. It follows that manual training and didactic teaching must go hand in hand. No didactic teacher is worth listening to unless he can supplement his didactics by demonstration; no demonstrator is worth his salt, however brilliant his technique, unless he can justify and explain his technique by scientific principles.

"The eye, the hand, and the mind must be taught to see, to work, to think, in unison; this is the underlying principle of dental education, and the putting of the principle into practice is the problem of dental pedagogics.

"Granted a good general education, manual training and mental training must begin together and must proceed together during the whole curriculum. It is because it is difficult to arrange for this that a decided preference is given by the Education Commission to the 'technique method,' i. e., dental hospital training.

"In practice it is found that with the technique method the first two years of manual training can be combined with the study of the preliminary sciences and of anatomy and physiology, the other two years being devoted to the general and special subjects of the curriculum, along with manual training and operative technique. At the end of four years the student may have something yet to learn by practice, accomplishment and experience, but he should know quite definitely, not only how to do his work, but why he does it. He should have acquired a profound respect for his art, and a determination never to use it save in accordance with scientific principles and the best surgical practice of his day."

I do not advocate teaching the medical student the technique, the art of dentistry, for this he could not learn without adding at least three years to his medical course. I believe, however, that he should prepare himself while in college so that he will be able to recognize pathological conditions of the teeth and those diseases which are associated with diseased teeth and dependent upon them for their origin.

As stated by Dr. Guy, each institution must be responsible to the profession and the public for the character and ability of the men that it graduates. The school that is willing to maintain a low standard is almost certain to have a class of students in keeping with that standard.

In 1881, the year that the charter of the Chicago College of Dental Surgery was granted by the state authorities, its Board of Directors included a representative of each of the seven medical schools of this city, and at the same time members of its Faculty or Board of Directors were appointed professors in the medical schools. The medical faculties in those days saw the value of teaching dental pathology to their students. There is no subject, perhaps, which today claims greater consideration among the most advanced medical men than dental diseases and oral prophylaxis. Yet the medical colleges have not courses of instruction in dental pathology. Where courses are given, they are optional with the students, consequently very few receive this instruction.

Dental education in its broadest sense must be extended so as to become a part of the curriculum of every medical college. One of the most trying experiences of a well trained, conscientious dentist is to receive orders from a physician to perform certain operations when it is too apparent to require comment that the physician who gave the orders has never acquired a knowledge of dental pathology. Volumes have been written on this subject, none of which have claimed his attention. In this age of advancement, medical colleges are establishing research institutes, hospitals for special diseases; yet practically nothing is being done to impart a knowledge to the student of medicine of the most prevalent diseases known to the human family. It is no wonder that the young medical graduate commits errors in the diagnosis of rheumatism, neuralgia and the like, because his medical faculty has never given him an opportunity to learn dental pathology.

The interns in hospitals, presumably the very best men who graduate, are at sea in their diagnosis when dental lesions have to be considered. And so dental education should by no means be limited to the dental school.

SUMMARY.

I am sure we can rely upon those now active in dental educational work to carry out the more elaborate course of instruction that has been adopted. In conversation with many of them I have been informed that they will faithfully carry out the four years' course of instruction, and all look to more thorough educational qualifications for matriculation. Immediately after the Minneapolis meeting last January, Dr. Kirk said to me, in about the language of his predecessors, that the fourth year would be of great value in more satisfactorily equipping students for their professional duties. I am sure that the sentiments expressed by him will meet with a hearty response from every thoughtful, progressive teacher in the profession.

With the passing of time our responsibilities have greatly increased. The science and the art of our profession have grown far beyond the expectations of the most optimistic. The microscope and the test tube have become potent factors in solving the problems of our profession. But while all should be trained in their use, only a few will become expert in manipulating them. Yet through those few, the others will learn how to prevent the inception of disease and thus become more useful to their fellow men.

The dentist must extract from all of the sciences and the arts whatever may be of service to him in the practice of his profession. The limit of the use of electricity in the various departments of his work is still unmeasured. The operating room and the laboratory call for newer and better schools than ever before. There has been a new awakening in the treatment of disease, as the field of dental pathology commands the attention of the most advanced in medical science.

All this and more calls for years and months and days and hours of faithful application in order to learn to perform this work well. The colleges obligate the student to devote thirty-two weeks' time in each year for four years. Many of these students occupy the interval between the sessions in college work, but that is optional. We have then, in four years of thirty-two weeks in each year one hundred twenty-eight weeks. Two years and six months, therefore, is all the time required by the State Board of Dental Examiners, and I sincerely trust that no college in the United States will endeavor to occupy a portion of this time in work which is not in any sense a part of the professional curriculum—nor do I think that the State Boards will permit any such deviation from the agreement entered into.

In conclusion: Let me say that one of the happiest thoughts of my life was the organization of the Chicago Association of Dental Faculties. It has always been a matter of great satisfaction to me to be able to truthfully say, at home and abroad, that the members of the dental profession in Chicago live in harmony and cordial relations. It has been especially gratifying to me to be able to say that the colleges of this city have worked harmoniously in their efforts to advance the standard of dental education and I sincerely hope that the four years' course, which was predicted thirty-two years ago, may be a *professional* course, and not one modified into parts including a portion of the work of the high school, the academy or the school of liberal arts of the University.

The question before us is: Can we get from the high schools of this country, graduates who are qualified to enter our dental colleges?

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.*

BY DR. P. A. PYPER, PONTIAC, ILLINOIS.

To the Members of the Illinois State Dental Society:

Owing to the plan of the program committee this year it was thought best not to make a collection and exhibit of the various articles invented during the past year.

The manufacturers have been very kind in supplying the committee with literature and information regarding the new inventions of the year. I have tried to make the description as brief, and at the same time as explanatory as possible regarding each article. It has been suggested to the manufacturers, if possible, to have the articles on exhibit with the various dealers at this meeting. For some reason unknown some of our manufacturers did not get a report to the committee, so it was not possible to get a complete report of all the inventions that have been put on the market the past year.

J. W. IVORY, DENTAL SPECILTIES COMPANY.

(1) Ivory's Lock Band Pliers.

Designed with sliding lock clamp, holding firmly matrix bands, Orthodonta bands, strips, or gutta percha points.

(2) Set of three Amalgam Pluggers.

Number 1, 2, 3, especially devised to more thoroughly condense and pack Amalgam between the matrix or band and cavity margins.

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*Read before the Illinois State Dental Society, May, 1916.

(3) All Metal Handle Porte Polisher, making it possible to sterilize without injury to instrument.

(4) New Root Clamps. (For Bicuspids and Molars.)
Made with projecting beaks extending below the clamp jaws so as to pass between tooth and gum grasping root firmly without injury to gums. Also right and left third molar clamps.

(5) Self-retaining Cotton Roll Holders.
A pair of cotton roll holders, right and left, hold any size rolls, and has handle with which patient can hold rolls in place or lever can be turned back under chin making it self-retaining.

(6) Pyorrhea Scalers.
Designed by Dr. Crenshaw of Atlanta, Ga., consisting of ten filers and two scalers. Files are so shaped as to be used either with a push or pull motion.

ILLY & COMPANY, INDIANAPOLIS, IND.

(1) Lilly's Dental Lotion.
A preparation of definite emetin strength, being endamebacidal and antiseptic, especially designed as a prophylactic agent in pyorrhea infections.

(2) Pinuseptol, a solution of pine oil. It is a powerful germicide and deodorizer, double the strength of liquid cresolis, six times more powerful than carbolic acid and cheaper. Practically non-toxic, pleasant odor, also admirably adapted for sterilization of instruments.

(3) Iodin Tubes.
Designed to sterilize the skin or any small area preparatory to giving hypodermic injections. Put up in small capillary tube. Used by breaking off each end of the tube and then touching it to the surface to be sterilized.

THE J. BIRD MOYER CO., INC., PHILADELPHIA, PA.

(1) The Hatch Swager.
Consists of shaft and inner tube filled with soft rubber which is held down by springs upon teeth mounted in end of another shaft in modelling compound; soft

rubber enveloping every portion of tooth and gold backing which lessens possibility of breakage of tooth in swaging.

CONSOLIDATED DENTAL MFG. CO., CHICAGO, ILLINOIS.

(1) All Cord Handpiece.
    Made extra long to avoid pullies and cord rubbing back of hand, also with a lock set screw for adjusting shaft.
(2) Sterling Bracket.
    Has an adjustable attachment to the wall, controlled by two sets of set screws, making it possible to adjust and keep the bracket table level at all times.
(3) Neutralite Investment Compound.
    Made of fiber compound and can be moulded by simply moistening and forming around the articles to be invested. The excess moisture dried out with a napkin and heat applied at once.
(4) New combination of temporary stopping with a superior wearing quality.
(5) An indirect lighting lamp for the dental chair.
(6) New form of light colored rubber dam. Their claim is superior strength.
(7) Metalite Pins for Vulcanite Teeth.
    Has a bright silver color, of great tensile strength. Fused into porcelain same as platinum pins. Not affected by acids.

FRIEDMAN BROS., CHICAGO, ILL.

(1) Dr. Johnson Crown Remover.
(2) Head Band with Three Retractors. One Straight. A right and left to hold up lip while curretting roots and for antrum operations.
(3) Dr. J. P. Buckley's Root Amputators, consisting of two chisels, one currett, and one tissue retractor.
(4) Dr. Emmet J. Craig, Kansas City, Mo.
    Pair of chisels, extra long handle for third molar extraction.
(5) Tissue Fixator, to grasp over-hanging tissue over the third molar when amputating the same.
(6) Pair of pliers with grooved beak for canal points.

(7) All metal port polisher for prophylactic work. Also for pulling strip through between teeth and for broach holder.

(8) Trephine for removing broken posts from roots. Gage 14 and 16, will cut uniformly either the post or tooth structure.

(9) End-cutting Burr with safe side for interproximal cavities so as not to cut adjoining teeth.

(10) Dr. Hanna, Cleveland, Ohio.
Surgical drills with extra long shaft for third molar operation.

AMERICAN CABINET CO., TWO RIVERS, WIS.

(1) Dental Cabinet No. 97.
Especially designed for narrow offices, attractively finished and conveniently arranged with all necessary drawers for instruments and materials. Special medicine cabinet with all labelled bottles in one row.

(2) Exodontia Operating Cabinet No. 1.
Designed by Dr. Geo. B. Winters, St. Louis, Mo. This cabinet is designed for the exodontia specialist or any general practitioner who has a room used exclusively for this class of work. Height is such that the top of cabinet is used as table upon which instruments can be within easy reach of operator. Numerous drawers to hold all instruments and material out of sight of patient.

(3) Exodontia Nurse Cabinet, No. 2.
As the exodontia nurse is a necessity in this specialty so is a cabinet designed to her special duties, containing table top and drawers for material and waste container.

(4) Prophylactic Cabinet.
Designed for instruments and materials of a specialist in prophylactic or pyorrhea treatments. It is so designed that a general practitioner can have this cabinet and a twin pattern for general operative dentistry instruments in same room.

(5) New Waste Receiver.

Designed with small wooden cabinet or pedestal with paper receptacle for waste.

(6) Office Bench.

A small bench that can be used in operating room (13½ x 13½ and 39¼ in height) with filing block, waste pan, and drawers for instruments for gold work. Also small plaster drawer.

(7) Barber's Dental Cabinets.

Two cabinets designed according to Dr. Barber's idea. An instrument cabinet so arranged as to keep all instruments and medicines out of sight of patient, which sets to back and right of chair. The other cabinet with cuspidor, Nitrous Oxid apparatus, engine and switch board all enclosed, sets at back and to left of chair. It is claimed by designer that having all instruments out of sight has a psychological effect on patient.

L. D. CAULK & CO., MILFORD, DEL.

(1) Caulk's Cement Pro Tem.

A zinc-oxyphosphate hydraulic cement containing percentage of copper for antiseptic purposes used in sealing in medicaments and for temporary fillings.

HENRY BOSWORTH CO., CHICAGO, ILL.

(1) Sterilizing Outfit.

Instrument and water sterilizers mounted on special table and aseptic steel cabinet for linen all mounted together. It is equipped so as to use gas, gasoline, alcohol or electricity.

(2) Drinking Glass Case.

Mahogany case with mirror back, glass shelves, will hold twelve glasses. A freshly polished drinking glass for each patient. Imagine the effect on the patient.

(3) Cylinder Covers.

Cover for gas cylinders made in any color to harmonize with color scheme. In the language of the manufacturer—"Doll up the gas machine."

(4) Crystal Glassware.

Specially designed glass containers for medicines and materials for the operating table.

THE KOLYNOS CO., NEW HAVEN, CONN.

(1) The Kolynos Syringe.

Designed for pyorrhea treatments, made of glass cylinder and plunger, pure tin nozzle and platinum needle, made to carry paste into deep pockets.

CLEVELAND DENTAL CO., CLEVELAND, OHIO.

(1) Dr. F. W. Frahm's Amalgam and Wax Carving Instruments.

Consists of three instruments numbers 1-2-3, designed to carve occlusal surfaces of large amalgam fillings, also wax inlay impression into normal sulci.

THE RANSOM AND RANDOLPH CO.

(1) Cutwell Burr.

Made from special prepared steel. A claim of superiority in cutting and lasting longer than the ordinary steel burr.

THE DENTAL SPECIALTY CO., DENVER, COL.

(1) Canning's New Regulating Appliance.

consisting of a flexible spiral spring arch with long nut on either end which is attached to bands on molars; by tightening the nuts it causes a constant slow pressure for the reduction of protrusion of upper or lower incisors. In very irregular sets of teeth, it is easily ligated and conformed to the teeth, but still has a continual follow-up movement, on account of its great tendency to resume its original form. This gives a slow and constant movement of the teeth.

(2) Canning's New Stiff Arch with Adjustable Hooks.

It is much smaller than the arches formerly used; has an adjustable hook on arch without soldering and destroying temper of arch. Especially adapted for the intermaxillary bands for power and for reduction of protrusion of the anterior teeth.

(3) Wightman Vacuum Casting Machine.

Consists of a vacuum suction cylinder and plunger which is placed on the floor and operated with foot, and connected to flask on bench by tubing. One stroke of the foot lever supplies sufficient vacuum pressure to cast inlay or aluminum plate.

STEWART DENTAL MFG. CO., PHILADELPHIA, PA.

(1) Stewart Interchangeable Tooth.

Consists of a porcelain facing and a one-piece gold back. The porcelain is provided with two tapering wedge-shaped dove-tailed grooves divided by a substantial rib of solid porcelain. The front and side walls of each groove extend forward and inward on elliptical arcs, terminating at a safe distance from incisal edge of the tooth with two bevelled edged points. The backing is made of one solid piece of 27 gauge, 20K. gold plate with two lugs corresponding in size and shape to the two grooves in the porcelain. The company claim on account of the mechanical combination a superiority of strength.

ILLINOIS SPECIALTY CO., CHICAGO, ILL.

(1) The Klondike Gold Dust Saver.

This is a muff-shaped transparent celloloid, so shaped as to make it possible to insert one hand into either end when grinding or filing gold and the grindings or filings are caught in the container pan at the bottom of the shield.

THOS. D. CRAIG, D. D. S., ALBIA, IOWA.

(1) The Craig Crown Remover.

A forceps with two sets of beaks. One grasps the root just below the edge of crown band and is clasped there by thumb screws on handle while the other pair of beaks grasp the edge of crown and pull by lever operated by thumb screw. It is claimed to be applicable to all kinds of crowns.

RITTER DENTAL MFG. CO., ROCHESTER, N. Y.

(1) The Columbia Distributing Panel.

A beautiful mahogany cabinet with all of the latest electrical conveniences and automatically controlled instruments.

Electro-Dental Mfg. Co.

(1) Electro-unit.

A beautiful mahogany cabinet with all of the latest electrical conveniences and automatically controlled instruments.

The Pelton & Crane Co., Detroit, Mich.

(1) The Electro-cabinet.

A beautiful mahogany cabinet with all of the latest electrical conveniences and automatically controlled instruments.

Owing to the numerous conveniences contained in the last three articles, your committee has omitted specific description of each and advises you to personally investigate them to thoroughly appreciate the companies' efforts to serve the profession.

(2) The Dentispray.

For Oral Hygiene in the home, consisting of an electrical air-compressor in a mahogany or white case (9½ x 9¾ x 13½ inches), mounted upon a pedestal for home use, giving a force spray for oral, nasal and throat sprays.

H. A. Whiteside, New York City.

(1) H. A. Whiteside Electric Dental Drill.

An Electrical Dental Drill consisting of a handpiece and the motor mounted directly upon it. Weight of motor is four ounces. Direct drive, one revolution of armature gives one revolution of drill. Has as usual, office foot controller giving four speeds, 600 to 2,800 R. P. M. forward and reverse. It is noiseless and operates on either alternating or direct current.

The S. S. White Dental Co.

(1) Revelation Coarse Cut Dentate Fissure Burr. (No. 700, 701, 702, 703.)

Made with just six blades cut deep and then coarsely dentated in a spiral; which gives plenty of room between the blades for the clearance of debris. The tapering shape of the head and its splendid cutting qualities make it especially adapted for the opening up of fissure cavities with least danger of undercutting.

(2) Crystal Borax.

A far superior product to the former Crystal Borax.

(3) Pulp Canal Cleaner.

No. 0. Special extra fine canal cleaner, smaller than the ordinary cleaner, calculated for the smallest of root canals. Of course it is necessarily very delicate and must be handled with great care.

(4) Buff Rubber Dam.

A rich cream (buff) color that helps to light the oral cavity. Has remarkable elasticity, is strong, tough and durable. Hugs tooth tightly excluding all moisture and keeps cavity thoroughly dry. Made in five and six inch rolls, in thin and medium weight.

(5) Impression-Tray Compound.

A compound somewhat the nature of a modeling compound, especially adapted to the making of individual impression trays, after the method of Dr. Rupert E. Hall. Black in color to easily recognize the plaster with which the impression is taken.

(6) Alloy Posts for Detached Post Crowns.

The rigidity of post is dependable in masticating forces. Can be annealed for fitting before setting, and solder up to 18K. plate can be used.

(7) Wood-Jaw Props.

They are rigid and occupy less space than the rubber bite block, hold the jaw immovably, are readily lifted out of place with the forceps. Can be boiled and sterilized. Six sizes from three-fourths to two inches in length. No. 1, 2, 3 and 4 will be mostly used. No. 5 and 6 are sufficiently long for extreme cases.

(8) Handy tongs, number 5.

(9) Syringe, number 27, Special.

This differs from the number 27 regular syringe, in that the point is ½ inch shorter and the opening of point at the end is a trifle larger.

(10) Rubber Dam Holder.

Is simple, practical and durable. The metal arches of the holder are so shaped as to comfortably conform with the cheek bones. When once securely fastened they will not slide or slip. The clamps grasp the dam firmly, but will not cut or tear it.

(11) All-Metal Elevators—No. 29C and No. 30c.

A tooth or root is readily lifted out of its socket by engaging it with the saw-toothed edge, resting the flat side of the elevator against the adjoining tooth as a fulcrum, and rotating the handle. Especially useful in extracting isolated roots and impacted teeth. A right and left.

(12) 18K. Gold Backing in gages 34 and 36.

A special backing which is carefully alloyed to prevent oxidation and maintain softness. It is not recommended, however, to be used with solder higher than those made for 18K. plate.

(13) All-Metal Root Elevators.

No. 0-C, 3-C, 6-C, 12-C, 27-C, 28-C. A set of six root elevators. The No. 27-C and 28-C are those suggested by Dr. Matthew H. Cryer. The right and left forms are for extracting molar roots. These six constitute a well rounded set. All metal handle can be sterilized in boiling water.

(14) White-Crocus Paper Discs.

In one grit, sixes, ⅜, ½, ⅝, ¾, ⅞.

(15) Aluminum Handle Plate Brushes, No. 103 and No. 105.

Made of the best Russian Bristles, hand drawn with brass wire into a sturdy aluminum handle, with three or five rows of bristles.

(16) Mortar and Pestle No. 7.

Made of Flint Glass, frosted all over. The mortar is the same size and shape as No. 3. The pestle is cylindrical, about ½ inch in diameter and 3¼ inches long.

(17) Nerve Dev. Fibre.

New formula consisting of Arsenic, Creosote, Tannic Acid, Oil of Cassia. Therefore it does not require a Harrison Anti-Narcotic Official Order Form, as was necessary for the old formula, the manufacture of which has been discontinued.

(18) Solder Tweezers—R. & S.

(19) Aseptic Glass Table No. 3, with Spider and Burner.

A round table with notched edges approximately 14 inches in diameter and is supplied in frosted finish. The dull nickel-plated spider is attached to an annular undercut base and is easily detachable. The gas burner is attached to the spider, and turns over the edge of the table. The burner therefore can not be upset. It is easily detached.

(20) Head Rest, No. 4.

Has a swinging frame with metal enamel pads.

(21) Woodbury-Crandall Cutting Instruments. Set of 35.

A new set of cutting instruments.

(22) University of Michigan Prophylactic Instruments, Set of 18. Cone Socket Only.

Designed by Dr. Bunting of the University of Michigan.

As your committee was able to give you only a short description of the 77 new things reported, we urge you to visit the various dealers during this meeting and get more and better information concerning these and many more articles which they have. The dealers need you, and you need them. Without either one the other can not survive.

PERSONAL EXPERIENCE.

BY DR. L. P. HASKELL, CHICAGO.

I have been impressed with the value of personal experience on the part of the dentist in solving the problem of the articulation of the denture.

Take the case of the dentist who has taken great pains to carry out the principle of anatomical articulation. He adjusts the case in the mouth and awaits results.

He has not the least idea of what is going on in that mouth in the process of learning to eat with the denture, what the motion of the jaw, what an important factor the lower lip is in mastication; what the tongue has to do with it.

In favorable conditions of the jaws and the dentures, the patient can use the lower jaw as in case of the natural teeth, such for instance as upper nicely fitting denture and lower natural teeth and bridges. Here there is little or no trouble. On the other hand the flat upper jaw, the flat lower jaw, or even with this, and a good upper jaw, grinding is impossible and for this reason patients are unable to masticate tough meat or other tough material because they demand grinding. In these cases the movement of the jaw is directly up and down. The lower lip is pressed against the denture to hold it in position and the action of the tongue is not describable.

I have arrived at these conclusions by this experience, viz.:—Seventy years' construction of artificial dentures of every description; for thirteen years before the use of vulcanite and including the use of the heavy continuous gum work for 64 years, in which I have proved that weight is of no consequence; more than thirty years' use of partial uppers, partial lowers and full dentures; and especially twelve years' use of that problem of the mouth, the flat lower jaw, and this problem I have solved to my satisfaction and so have others to whom I have stated it. I have been glad to have this experience although it involved for many years edentulous jaws. And so, too, glad I can be of help to the profession, for the dentist who has not had a similar experience has no conception of what the patient has to go through with in learning to eat with dentures under these unfavorable conditions.

THE DETRIMENTAL INFLUENCE OF THE DENTAL QUACK, AND A POSSIBLE REMEDY.

BY DR. H. A. HONOROFF, CHICAGO.

"Let me live out my life in the heat of blood!
Let me lie drunken with the dreamers' wine!
Let me not see this soul-house built of mud
Go toppling to the dust a vacant shrine!"

Twenty-seven centuries before the Christian era the Chinese dentist used to prescribe pulverized bones of dead animals incorporated with garlic, to be snuffed up in the left nostril, if the person suffering from toothache be a man, in the right, if a woman, and at all times this ancient dentist promised that cure would be certain. Rather an odd way of treating tooth-ache. But why be surprised at the Chinaman, when even at the present time there are in the very midst of civilized communities dentists who treat their patients even in a more horrifying and more distressful manner than the Chinaman did 4,000 years ago? We cannot boast of progress, if in the twentieth century, we still tolerate the dental quack, who is applying mummifying paste as a remedy against any sort of toothache, and announces, "if I hurt, you don't pay me," and to make his bargain, a certainty, promises that "all work guaranteed." Who of the two should be considered a greater imposter and parasite? The superstitious Asiatic barbarian of 4,000 years ago, or the heartless crook of the present day?

It is logical to assume that with no civilization to back him, with a very scant knowledge of science, and with only rudimentary appliances at his command, the ancient dentist, in resorting to the methods he did, was doing his very best towards the relief of his suffering brethren. No one would be justified in accusing the primitive man that his ways of treatment were malpractice. But what excuse may be found for the "civilized" quack? What excuse may be found for this enemy of society, who in spite of all the sciences and arts at his command, in spite of all the improvements and inventions which civilization has surrounded him with, wilfully, and contrary to all moral law, is still continuing to cripple all who come to him in the hope of being cured?

In the eyes of the profession there is none. No conscientious dental surgeon or physician, it matters not how mild a critic he may be, will find even a particle of an excuse for the vicious practice of the vampires of the dental "parlors." No honorable professional man can observe without a feeling of disgust the prevailing conditions of dental quackery, where practically every prominent corner building in every city of the continent is besmirched with shining $3 marks, the price for *everything* there is to be done in the line of dentistry. And the fanciful designs of "tin cans" which are "guaranteed for 10 years!" And the bucketful of extracted teeth, which were "pulled" without pain! And the special bargain week advertised in the newspapers!

How painful it is to the ethical man to know that all this humiliating rot is intended for nothing else but for luring prospective victims inside. The honorable professional man cannot under any circumstances reconcile himself to such deplorable conditions. He will always revolt against them. But what about the laity? What do they think? They, who do not distinguish the difference between the ethical man and the crook? They, who do not know the action or the meaning of mummifying paste any more than that of the "10 years guarantee." They, who have a right to think that every dentist licensed to practice dentistry must do it in the best way possible? The poor souls! They are being bled without mercy, and they pay for it. They are being abused and exploited in a most shameful manner, and they are thankful for it. They are being crippled and slaughtered in quantities and they don't know it! The great trouble with the laity is that they don't know, and it is a great pity that the ignorance is being instilled into the public by the instrumentality of the quack.

If the public only knew of the awful abuses to which they are subjected by the quacks, the practice of quackery would be exterminated mighty quickly. But the bewitching influence of falsehood, and the golden promises of material savings have been getting the best of the trustful public. The public is being educated to demand a 10 year guarantee, no matter what the case may be. They are being taught of prices, which are impossibly low. They are being trained to bargain with the dentist, to dictate to him, and to consider his hard labor as something which can be gotten for almost nothing. Many a patient will insist upon having the "nerve killed," where there is no pulp trouble at all, others will insist upon having their teeth "re-enameled," and still more patients will ask for "platinum" fillings and "stick-to-me plates" with "whale bone teeth"!

These eccentricities of public demand are not the public's own inventions, but they have come to the public through the filthy efforts of the dental quack, who is making the good public his laughing stock.

The quack is poisoning the public mind with the same cold-blooded indifference as he is poisoning their bodies. The quack is teaching the public that the wrong thing is the best, and the public is learning this injurious lesson to its perilous disadvantage. A great number of our citizens are becoming fiends of quack dentistry, and at the present time they seem to demand more and more of it. It is an outrage that at this stage of civilization, at this time when the whole world is looking up to the services of the dentist as of the highest importance in the way of preventing disease, things should assume such a threatening character! But to our sorrow this deplorable fact is an unmistakable one. The quacks are predominating in this country. It is high time that some measures be taken to remedy this evil condition. The law should intervene and prohibit the practice of dental quackery. But for some reason law-makers do not seem to realize the importance of anti-quack legislation. How much some legislators are doing in this regard may be seen from what Dr. W. T. Hardy, Secretary of the Wisconsin State Board of Dental Examiners, has to say. In the DENTAL REVIEW of December, 1915, the Doctor, under the heading of "Dental Legislation," among other things writes: "At the present session of the legislature a bill approved by the legislative committee of the Wisconsin State Dental Society was presented by the Board, and which, if enacted, would have given the Board power to revoke a license, after a hearing by the Board and a review by the circuit court, for gross ignorance or inefficiency, for immoral, dishonorable or unprofessional conduct (unprofessional conduct being defined as meaning the employing of what is known as "streeters" or "cappers" to obtain business. The obtaining of any fee by fraud or deceit, wilfully betraying professional secrets, employing any students or unlicensed person to perform operations of any kind upon the human teeth or jaws, for the advertisement of dental business, or treatment of devices in which untruthful or impossible statements are made, or for habitual intemperance or gross immorality).

"The opposition, however, were able to convince the senate committee on education and public welfare that such a measure would confer too much power and authority on the Board, with the result that the committee recommended a substitute bill which was a compromise, and which materially reduced the effectiveness of the measure.

"The opposition consisted of 'The Modern Dental Ethical Society,' their paid attorney and the representatives of the daily newspapers of Milwaukee, who contributed their presence and their columns to help the advertising dentists. Some of you may want to know who composed the Modern Dental Ethical Society. In answer to which I can inform you that it consists of the proprietors and managers of two or three advertising offices in Milwaukee and the operators employed by them, of whom it was natural to expect that they would co-operate with their employers. Probably the total membership does not exceed ten or a dozen. The organization was hurriedly gotten together and incorporated to defeat the passage of the bill known as 182S. Apparently this was its only purpose."

From this quotation it will be clear that the quacks are an organized gang with ring leaders among them, who know how to pull political strings, and with politics, as is now understood by that word, not much can be expected of our law-makers in a way of protecting the welfre of the public through proper legislation.

There is another remedy, and to my mind, the best and most effective one for saving the public from the "10-year guarantee" mania and similar psychological defects bred by the quack. This remedy is within the reach of every ethical dentist, and, if properly applied can bring good results. Proper education in the care of the teeth and mouth is what the public needs very much. And this can and should come to the public through the efforts of the ethical dentist. It should be the duty of every ethical dentist not only to extract bad teeth or to repair them, but also to teach his patients. Every conscientious dentist should talk to his patients ethical dentistry; he should impress upon his patients the great importance that dentistry be ethical and nothing else; he should show them the difference between good and bad dentistry; he should tell them of the evil results that are bound to follow "quack dentistry," and in such a way he will render his patients a great service. A dentist can do more for his patients by being conscientious and by giving them good advice than by simply adorning them with a lot of "mouth jewelry," and discharging them without any instruction.

Too much emphasis cannot be laid on the necessity of public lectures. Every ethical dentist should see to it that the community in which he is practicing should learn the principles of oral hygiene from prominent lecturers. Something in this direction is already being done by the various ethical dental societies, but there is still much room for improvement.

In connection with this it is gratifying to observe that large business establishments are beginning to realize the effects of good dentistry upon the efficiency of their employees. Institutions, such as Sears, Roebuck & Co., Montgomery Ward & Co., etc., are already equipped with modern dental infirmaries, in charge of high-class dental surgeons, where the employees are being examined as to their mouth conditions. These employees are being instructed in oral hygiene, and are being especially warned against the quacks. These great business houses, who no doubt know how to save money, do not try to economize by sending their employees to the $3-a-set-dentist. No, not by any means! They pay good prices and have the dental work for their employees done by ethical dentists of reputation. These firms are desirous of saving the health of their employees and they know too well that the quack is not the man who will do it.

The ethical dentistry propaganda should be carried on with all possible vigor, through such channels as large business houses, large factories and public institutions, where men, women and children can be reached en masse, and told of the dangers to which they are subjecting themselves by entrusting their health to the quack.

Agitation of this character *must* bring favorable results, and if done in earnest, it may be hoped, that the time shall come very soon when the quack will vanish from our midst.

RESUME OF PYORRHEA TREATMENT.*

BY DR. C. M. SMITH, PEORIA, ILL.

There are still many members of our profession who seem to be disturbed over the inadequacy of the term "Pyorrhea Alveolaris." Each one of these maintains that his selection of a name is more suitable. The following is a list of names for a disease, the etiology of which has not yet been proved: 1. Riggs Disease. 2. Pyorrhea Alveolaris. 3. Alveolar Exostosis. 4. Alveolar Periostitis. 5. Loose Teeth. 6. Pericementitis. 7. Phagedenic Pericementitis. 8. Interstitial Gingivitis. 9. Alveolar Absorption. 10. Necrosis of Teeth. 11. Alveolar Caries. 12. Atrophic Alveolitis. 13. Odontolithus. 14. Stomacace. 15. Expulsive Gingivitis. 16. Phogenic Alveolaris. 17. Arthro-Dental Gingivitis. 18. Suppurative Peridentitis. 19. Alveolar Dental Arthritis. 20. Septic Gingi-

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*Read before Peoria County Dental Society, Tuesday, Feb. 7, 1916.

val Catarrh. 21. Gum and Alveolar Disease. 22. Hematogenic Calcic Pericementitis. 23. Phlegmonious Inflammation of the Gums. 24. Inflammation of the Peridental Membrane. 25. Inflammation of the Periosteum of the Teeth. 26. Osteo-Parosis of Tooth Sockets. 27. Chronic Marginal Purulent Periodontitis. 28. Chloasma Traumaticum of Gingival Tissue. 29. Chronic Alveolar Osteomyelitis. 30. Dental Alveolitis.

It would seem that the establishing of a cause of a disease is quite as important, if not really more so, than the selection of a fitting name. While it is generally recognized that a suitable and definite name should be given to every specified and pathologic condition, nevertheless, when the main and common objective is a cure, the name, after all, is of secondary importance.

The results obtained from the present treatment of pyorrhea are more encouraging than ever before. There are a large number of dentists, including many specialists, who agree on one method of treating this disease, and the results obtained by these men are more uniform than those recorded by others outside of this class. These operators referred to are dentists who have developed skill in the removal of deposits and planing of root surfaces, and are generally known as Localists. They maintain that pyorrhea is a local disease and that local surgical treatment is the only treatment by which results can be obtained.

The other class are dentists who are less skillful in the surgical treatment, and while they agree in general with the localists, at the same time they pin their faith largely to medicaments and are prone to sway with every new wind of doctrine along the line of medicinal treatment. With this class the fundamental error lies in their neglect of the indispensable scaling and polishing. The more remote from perfection along this line, the more drugs used; and this, perhaps, accounts for the great array of drugs commonly used in the treatment of this disease. Numbered among this latter class are the few medical men who are forced to depend upon dentists for co-operation in the local treatment. Unfortunately, however, either or both may be lacking in the knowledge of what constitutes proper co-operation from the dentist.

There has been suggested for the treatment of pyorrhea almost every therapeutic agent known to medical science which could, by any possible stretch of the imagination, be utilized. The modern saying, that therapeutic wealth is poverty, is nowhere more true than in the treatment of pyorrhea. If this disease is amenable to medicinal treatment, the drug, or combination of drugs, that will, by itself, cure it, has not been found. The following remedies have been used in the treatment of pyorrhea: Leeches, Ether, Gum Camphor, Ointment Veratrine, Black Oxid of Copper, Magnesium Citrate, Tincture Iodin, Chlorate of Potash, Acetate of Lead, Mercury Protoiodid, Sulphur, Magnesium, Creosote, Glycerin, Tannic Acid, Aqua Fontana, Tincture of Opium, Zinc Chlorid, Silver Nitrate, Capsicum, Myrrh, Echinacea, Borax, Aromatic Sulphuric Acid, Alum, Hydrogen Peroxid, Chlorid of Ammonia, Phenol, Pyocyanase, Salicylic Acid, Corrosive Sublimate, Tincture of Calendula, Lactic Acid, Chloroform, Ratany, Cocain, Ammonium Bi-Fluorid (IK-I Treatment—Spengler), Sodium-Perborate, Tartrate of Chinolin, Nitric Acid, Zinc Iodid, Aqua Regia, Caustic Potash, Acetic Acid, Chloral Hydrate, Spirits of Cochlearia, Mercuric Bichlorid, Rescorcin, Hydro-Naphthol, Essence of Peppermint, Formalin, Cresylic Acid, Ethel Borate, Bismuth Sub Nitrate, Pyrozone, Thymol, Lavender, Anise, Alumnol, Tri-Chlor, Acetic Acid, Quinine Sulphate, Eucalyptus, Benzoin, Rosemary, Cologne, Lysol, Boric Acid, HCL, Ichthyol, Permanganate of Potash, Campho-Phenique, Morph. Acetate, Tincture Umkaloabo, Tincture Chijitze, Pulp Removal, Cold Applications, Extraction, Scaling and Polishing, X-Ray, Highfrequency, Radium, Monohydric Chromic Acid, Tincture of Arnica, Emetin Hydro-chlorid, Serums, Vaccines, Succinimid of Mercury.

In discussing these remedies, the bulk of them may be divided into a few groups, and those that have attracted special attention will be discussed separately.

The escharotics and cauterants have very little use, if any, in the treatment of pyorrhea.

The antiseptics have merit insofar as they assist in surgical cleanliness.

The germicides and astringents are valuable adjuncts in the local treatment. The zinc preparations, for their astringent properties, and the iodin preparations for their germicidal potency, are by far the most important of these two groups.

Leeches have been used for many centuries to relieve congestion and are still in use, but in the treatment of pyorrhea they are obsolete.

Pulp removal was for a time practiced as an adjunct in the treatment of pyorrhea. It was contended that the removal of the pulp would divert the circulation to the peridental membrane. This is now ancient history.

Tartar Solvent: Dr. Joseph Head in 1909 brought out this treatment. It too attracted considerable attention; no therapeutic value was ever claimed for it. It was intended only to facilitate in the removal of deposits.

Bismuth Subnitrate Paste was introduced by the late Dr. Rudolph Beck of Chicago. It attracted considerable attention. It was not considered a specific; nevertheless, great claims were made for it and many of our prominent men wrote favorable testimonials, which have since become part of the proceedings of the Illinois State Dental Society 1910. Just this one testimonial may show how elastic one's imagination may become. Dr. Enrique Garrison of Jalisco, Mexico, states he had used every known remedy for the treatment of pyorrhea. Since last September (that is, the September preceding the May when this report was made) he has used Bismuth exclusively; more than twenty-five cases have been treated and entirely cured. This statement is not only misleading, but in the light of our present knowledge it seems ridiculous.

Radium in the treatment of pyorrhea was popular in Europe. Trauner of Gratz, Hungary; Warnekros, Vienna; Levy and Newman of Berlin, all have treated pyorrhea with radium. Levy reported 18 cases with excellent results. Newman thought that in the cases reported by Levy equally good results could have been obtained without the use of radium. He further states that in 27 cases treated according to the method of the three noted observers, no progress in healing was noted. It was only after a careful scaling that healing occurred. This treatment made no impression on American dentists.

X-Ray and Highfrequency. I shall quote three well-known authorities which I think will dispose of the X-Ray treatment very satisfactorily. Dr. Weston A. Price reports some excellent results with X-Ray, but says, "Previously, cleanliness of pockets must be insured and suitable washes and sterilizing solutions should be used." Dr. M. I. Schamberg states, "I am not satisfied that the improvement was as much due to the X-Ray as to the other treatment instituted in these cases." Dr. Howard Raper states, "X-Rays have been employed in the treatment of pyorrhea, but no results have been obtained that could not have been gained by easier methods of treatment; as a therapeutic agent in dentistry the X-Ray is worse than useless."

Highfrequency, as an adjunct in the local treatment, will be of benefit equal to that of any form of massage.

The most glowing success for any agent is that reported by Wright and White of the United States Navy. In 60 cases treated with succinimid of mercury, 100 per cent success has been attained. It is unfortunate that succinimid was introduced just at a time when the profession is so absorbed in experimenting with emetin treatment. Just why the profession did not instantly give up the less promising emetin for the more promising succinimid may be difficult to explain.

In 1757 Bourdet first recommended the elimination of pockets by surgical interference. This treatment has been modified by various operators, and even now it is considered good practice. However, it has great limitations.

Extraction: As early as 1746 Fauchard and Jourdain, in the surgical treatment of pyorrhea, recommended extraction as a cure; and it is generally considered so to this day. Dr. Ferdinand Byrne, in November, 1915, Cosmos, takes exception to this practice as a cure. He thinks extraction is not a cure, and that absorption prevails even after extraction. This is evidenced in any mouth having a history of pyorrhea. For example, plates after five years do not fit.

If no necrosed bone exists and healing takes place normally, the testimony is not in favor of Dr. Byrne, and extraction is positively a cure for pyorrhea. It is the only treatment that does not require previous scaling and polishing. There is only one disadvantage and that is, when exercised as a result of poor judgment the life of the affected tooth is prematurely ended.

No treatment attracted world-wide attention in so short a time as Emetin Hydrochlorid; and perhaps no treatment has been more abused. That emetin is an adjuvant in clearing up the infection is admitted by nearly every observer. But when one considers the fact that

(1) The pathogenicity of the endameba has not been proved;

(2) Ameba are secondary to the formation of pockets;

(3) Scaling and polishing are indispensable,

one must feel like Dr. Talbot when he asks: "Why select one of the least harmful and give it all the credit for pyorrhea and leave some of the most pathogenic as not worthy of consideration? If there are at least 150 varieties of germs in the mouth, what becomes of the other 149 when the ameba is destroyed with emetin? And if iodin is a more powerful germicide than emetin, why use emetin?"

To what extent emetin is valuable in the treatment of pyorrhea I am not prepared to say. In my own experience its use has not yet become necessary.

The many failures experienced in the use of this remedy could have been reduced if dentists had first established the presence of ameba in the case under treatment, and then instituted proper surgical treatment in connection with the use of emetin.

Vaccine therapy: Many articles dealing with vaccine therapy have appeared in medical as well as in dental journals. Here the dentist and physician met on common ground, and in no treatment of pyorrhea was co-operation more essential than in vaccine therapy. The physician recognized that local treatment was indispensable and the average dentist's limited knowledge of bacteriology made the physician a necessary co-worker. Goadby, who was perhaps the first to write on this subject, reported a large percentage of cures. Eyre and Paynne, Jones and Humphreys, Harris, Beebe, Hitchins, Stewart, and many others have reported excellent results from vaccine. The most extensive reports are those by Medalia of Boston. The local treatment in his cases comprises practically everything that could be expected; the author considers the local treatment indispensable and recognizes the importance of using a staining solution in the post operative treatment to disclose plaques.

In view of the fact that a specific bacteria has not been discovered, the treatment with vaccine is not a scientific procedure at the present time. It is true that more than twenty forms of bacteria have been found in pyorrhea pockets and many of these may be present at the same time. If a vaccine is made of one particular germ, what becomes of all the others, including the ameba? If emetin is used, how are all the pyogenic organisms destroyed? It does not seem reasonable that a pocket containing pus and free drainage and walled off from the healthy tissue, which it can enter only when a break in the continuity of the tissue takes place, can be so favorably affected by agents introduced into the circulation. It is a recognized fact that pyorrhea infection is secondary to the formation of pockets, and it has not yet been shown that results obtained with vaccine could not have been obtained by local treatment alone. That being a fact, it would seem inadvisable to resort to a more complicated and uncertain method of treatment when simpler and more efficient methods are available. After all, it matters little what is used—vaccine, emetin, or what not. If there is faith in the remedies, and previously, thorough surgical treatment has been given, results will follow.

Scaling and Polishing: Among the most popular methods recommended by American dentists was the treatment outlined by Dr. Riggs. This consists of carefully removing the deposits and all necrosed alveolus. Outside of improvement in the shapes of instruments the only innovations that have occurred since Riggs' treatment was outlined have been in the adjuvants used.

Riggs' treatment is the only one that has stood the test of time. In a review of over 200 references on the treatment of pyorrhea, regardless of what other treatment may have been instituted, scaling and polishing is considered an indispensable prerequisite. Even as early as 1728 Pare and Fauchard emphasized the need of thorough scaling and polishing. When this treatment is skillfully administered there is seldom any need for medicaments. While it is true that vaccine, emetin and other medicinal agents may possess merit and be valuable adjuncts in the management of certain cases, their use cannot be curative but rather palliative, as the pockets will remain favorable for re-infection unless eliminated. In spite of the many panaceas offered to the dental profession for the treatment of pyorrhea, the dentist has not gotten beyond the treatment outlined by Riggs.

It is true that pyorrhea is being treated with more success today than in the past, but that is not due to the great array of remedies at our disposal. It is due more to the fact that more dentists have become interested and more patients are demanding this service. It is not within the scope of this paper to speak of the etiology of pyorrhea; but this will be done only to emphasize the great importance of the removal of deposits and plaques. Evidence strongly points to deposits and plaques on the necks of teeth as the initial cause for pyorrhea. Even Medalia, the priest of vaccine therapy, recognizes this fact, and Hartzell, one of the most prominent pyorrhea specialists, states, "Experience indicates in no uncertain terms that the gingival margin is the point where pyorrhea inflammation begins, and experience has also taught that unclean tooth surfaces precedes gingival infection. Experience has further taught that the logical place to begin with the treatment of pyorrhea is the tooth surface."

Assuming that a cause other than deposits may be established, it is still reasonable to assume that the deposits and plaques will always maintain their present role as causal factors; and it is further reasonable to assume, regardless of what other treatments may be given, nothing but failure can follow any imperfection in the removal of deposits and plaques.

It is not the object of this paper to decry the use of medicinal agents in the treatment of this disease. Any remedy that will assist in bringing about the desired result should be utilized. But the main point in this paper is to emphasize, first, the importance of surgical treatment of this disease, and last but not least, the great value of prophylaxis in the prevention thereof. When dentists realize that pyorrhea is preventable, and can be easily and permanently cured in its earlier stages, and that no drugs or vaccines of themselves will ever cure, and that the chief reliance must be placed on the local treatment, then dentists will direct their efforts more along this line of treatment instead of pinning their faith to other agents.

Of all the treatment mentioned, prophylaxis is by far the most important. This treatment, to be administered satisfactorily, is within the reach of every practitioner of dentistry. Inclination is the one thing above all others necessary to obtain success. To think that prophylaxis must be done by a specialist is nothing short of ridiculous. No one has ever claimed specialization in cleaning teeth. Prophylaxis means nothing more than a thorough cleaning. It is true that ideal prophylaxis includes the elimination of all irritation existing in the mouth. To restore to health a mouth containing many ill-fitted crowns and poorly contoured fillings, in addition to the removal of all deposits and the polishing of sensitive gingival areas, is a procedure often representing considerable expense and time. Circumstances and conditions are often barriers to such ideal service. But there is no valid excuse why the cleaning should not be carefully and thoroughly done even if the removal of other irritants must be deferred.

As previously stated, the one thing most necessary to success is inclination on the part of the dentist. The patient's willingness to receive this service is quite as necessary, and to attain this the operator must believe in the merits of such treatment, be enthusiastic, and adopt a definite plan of procedure. He must insist on regular visits, and should assume the responsibility of notifying when the time for prophylaxis treatment has arrived. It is only an earnest effort that can procure the patient's co-operation and retain his interest.

In closing I wish to quote from Dr. G. V. Black's latest book: "It is the general practioner who must discover deposits of salivary calculus, and he must so train and control his patients in the care of their mouths that these deposits will be prevented, if he will save his teeth from being lost from this cause. Likewise, the general dental practitioner is the one who must discover the deposits of serumal calculus on the enamel and remove them before serious suppuration occurs. The operation necessary for the prevention or cure of most of the injuries to the gingivae are routine dental operations carefully and properly done. If one is practicing dentistry at all, he should be acute enough to see these things, and careful enough to prevent or correct them. Our greatest hope for the future is in the application of preventive treatment by all dentists, rather than in the palliative treatment by specialists."

PROCEEDINGS OF SOCIETIES.

THE ASSOCIATED DENTAL FACULTIES OF CHICAGO.

A joint meeting of the Faculties of the Chicago College of Dental Surgery, the Northwestern University Dental School, and the Dental Department of the University of Illinois was held at the Palmer House, Friday evening, March 31, 1916, with Dr. G. W. Dittmar in the chair.

Dr. Truman W. Brophy read a paper entitled "Dental Education."

DISCUSSION.

MR. JOHN D. SHOOP, Superintendent of Schools, Chicago:

Mr. Chairman and Members of the Dental Profession: I am very glad indeed to be here tonight. It is an excellent thing for a schoolmaster to brush the dirt off of his clothing and take a pencil away from behind his ear and get into the rank and file of the people to view his work from a different perspective.

I was remarking to Dr. Brophy, as we were sitting here together, that we are living in a remarkable age—an age in which men are getting together, men of the same profession. Formerly, when men were lined up in the same profession or business they considered themselves as business enemies or there was professional enmity; but today they are realizing that there is something in each of us that can be capitalized in a manner in which it will be helpful to one another. It is indicative of the new spirit of a new age and new era in our great business and profesional life when men see they can learn from one another and come in contact with one another in the same lines of human activity.

I congratulate you, representing as you do, the three great dental schools in our city, representing also your private profession, many of you close together, that you can come and sit around the banquet table and exchange ideas and know more of each other and your profession.

I have listened with a great deal of interest to Dr. Brophy's paper. I have been interested in it because of the progress that he indicates. There was a time when the jack of all trades was really a man who had a place in society. We are beginning to realize today that the general purpose man, while he may fit in to certain niches of human conditions, is not so much in demand as he was at one time. We are progressing along the line of specilization in all trades and professions. One of the hopeful things in the professional world is that you are requiring of everyone that crosses the portals of the colleges which you control that there shall be a standard of qualifications and fitness commensurate with the responsibility they are to assume. In doing this you are helping the schoolmaster. Our boys and girls are beginning to recognize that the world is not ready for them until they are prepared, and they are remaining in schools longer than they ever did because of the standards set, and business men realize that it is a much more difficult thing now to take an operator or workman in our great industrial institutions and commercial institutions than it was a few years ago.

I have been interested also in knowing some of the weaknesses of our boys and girls who come to you. I hear a great many stories from men to whom we send our children. I sat by the side of a business man some time ago and asked him this question, "What do you find in the boys and girls that come to you from our public school system that you would most criticise?" He replied, "I believe if there is one thing above all others I would criticise in the boys and girls that come from the public schools it is the almost utter lack of a sense of responsibility." I do not know but that in a measure may explain some of the conditions of weakness which you find.

We are living in a rather peculiar age. We forget sometimes how readily society has transformed itself. We are living under altogether different conditions from those which formerly confronted us. Scarcely any of you here tonight realize that your homes are so different from the ones in which you were brought up. Most of us were brought up in single houses. Today we have to live very much like the cliff dwellers in layers, one above the other, and the opportunity for individual responsibility is not so great in the home and is supplemented by agencies created elsewhere. It is said, you can tell a dog that is raised in a flat. He invariably wags his tail up and down instead of sideways. (Laughter.) There is no room for the characteristic lateral way. Many of our boys and girls are brought up under similar conditions, and on account of that fact have peculiar marks and traits of character which they show when they go out into the world.

I had a letter a day or two ago from one of the largest commercial institutions in this city which gave me an insight into the limitations which are common to boys and girls of the eighth and eleventh grades. It grated on my finer sensibilities. I wrote him that I was very glad he had called my attention to the thing because we, as school men, do not take the trouble sometimes, but we will do so by and by, to lay the foundation of good business common sense in our management to follow the product out into the market and find out how they are suiting the trade. There is no great institution in our country but that follows its product out to the very home of the consumer to see how it is fitting into the economy of human life. So I think by and by you will find around the many dental colleges, if I have my way about it, representatives of our great public school system who will be inquiring how the boys are measuring up to the requirements of your profession, and I feel tonight the criticism that has been offered, although I am not able to measure the extent of it excepting in terms as you have expressed it to me. It will set us to thinking. The value of what a man has to say lies not so much in the fact of what he gives us as it is in the thought that he provokes. After hearing from Mr. Downey who has to do with the preparation of boys and girls for the life they are to lead, the words of Dr. Brophy will doubtless have sunk into rich and fertile soil.

I want to pay tribute tonight to the efficiency of your leader. I want to pay tribute to the work that has been done by the dental profession in this city. I remember that Dr. Brophy stepped into my office about six years ago and revealed to me, for the first time, the intent of the dental profession in this city to establish clinics in certain schools or in one particular school as a test. I remember telephoning all the way to Cincinnati for my chief to find out what she had to say about this new innovation in our public school system. Through the agencies and assistance of men of sympathy who were in accord with his idea the first dental clinic was established in an old building down in South Chicago. The work accomplished has been remarkable, and not only has there been effort and willingness on the part of the dental profession to create these clinics for the benefit of the children who are really needful of your services, but now we are receiving demands and requests from every part of the city that this work may be multiplied and extended into other portions of our great municipality. I want to pay this tribute to the initial movement made by the Odontological Society and to you gentlemen who form the great rank and file of the dental profession in starting this measure which in time is going to assume magnificent proportions.

I want to tell you something else. We as school men are studying many phases of this educational problem from the standpoint of health and the soundness of the individual. It is only in recent years we are beginning to realize and to recognize that one of the essential factors in the evolution of the right kind of mental growth is to have a good place where the nutrition that goes into the body shall receive the proper operation before it finds its way to the centers of the circulatory system. In other words, we are beginning to find out that, after all, we cannot get along without the dentists even in our work of education, and more and more our great students of the physical conditions out of which the best mental results are obtained are cautioning us to be careful of the teeth of the children and to see that they are well taken care of.

I might tell you a secret, although I do not know that it is an open secret, but when this movement was first launched there were those who came to my office and said it was an advertising scheme; there was selfishness at the bottom of it, and you were merely getting the names and addresses of the children who had bad teeth so that by and by when they grew up you would be able to make a good deal of money in filling their teeth and treating conditions of the mouth generally; that you would get your share of it by means of advertising your business through this agency. I turned these people aside. I never believed them.

Tonight I feel I am justified in saying to you that you have inaugurated a movement that is going to react helpfully not only upon the physical conditions of the children, but through these conditions on the mental health as well.

After relating a story showing the keen competition in business, Mr. Shoop said: No longer do we find men engaged in the same business and in the same profession indulging in destructive criticism and destructive competition. The thought of the age is that of the constructive, building along by the side of that which the other fellow has created, something that will cast his product, if possible, in the shade. That is what we mean by constructive competition, and it is only through such competition as that that progress in the line of profesional occupations or business is possible.

I am pleased to note that as I go from place to place permeating the rank and file of the great business and professional world is that same get together spirit. Out of that same spirit there is going to be borne not only a higher standard of business ethics and a higher code of professional ethics, but out of just such a get together spirit as that there is going to come the Chicago of our fancy and of our ideals, the city of our dreams, for by and by the great divisions into which society has separated itself, those that have been at war, each suspicious of the other, the great hordes of labor and hosts of capital are coming to see that the only way in the world to make progress is for them to come and get their feet under the table and talk over this situation to see if along the line of co-operation there can be adopted a constructive policy upon which each may operate and on which all may build for their own betterment. In this spirit I am glad to meet you tonight.

I happen to be identified with one of our great educational organizations in the United States. I do not know whether Dr. Brophy referred to our Chicago schools or to the high schools in general, but it will be my aim to undertake to set in motion the idea that one of the essential things in the round-up of an education of an individual is the ability to express himself in the right kind of English. I believe Dr. Brophy is just in his criticism in that regard. I do not doubt that he is, and I am glad to see it from your side of the fence. I think one of the troubles has been in these modern days of realism that we have lost something of our rightful concept of the value of expression. Emerson tells us that man is one-half himself and the other half is expression. They tell the story of a boy in school who, when the teacher asked him to name the bones in the cranium, replied, "Well, I have them in my head, but I cannot name them." The only way I can think is in terms of expression. One of the difficulties is that we indulge too much in the pouring process. We can lecture to men of your age and standard of development and acquirement, but you cannot lecture to children and make them grow any more than you can lecture to pigs or corn and make them grow. They must have the elements of growth brought in contact with them and exemplify and objectify them in some way that Nature has given them for expression. In a way we are little out of poise and balance, and I promise you tonight that my best efforts shall be given towards restoring the equipose in this great thing we call education.

I wonder if you men have any objection to sending some of our school men to visit your colleges. If not, we will ask them to do so and try to extend this get together spirit to the point of professional organizations and professional life of our city so that we may touch shoulders with our great public school system and find out where the defects are and do the best we can to provide a remedy for them.

It has been a pleasure to be the recipient of your courtesy this evening and to meet you face to face, and I am sure under the slightest provocation in the future I shall be glad to come back to you. (Applause.)

Chancellor J. J. Tobias:

I am glad to have the opportunity of being present on this occasion to look into your faces and learn what I can from you. Knowing that our mutual friend, the Superintendent of Education, would be here and having been interested and engaged in this work for a long time in this city and through the state, as well as in the work in which you are deeply interested, I came here to seek information.

I have been engaged in this preliminary educational work for more than twenty-five years. I have endeavored to educate my children, and if the Superintendent of Education will excuse me, I will say that for reasons physical and otherwise, I took my child out of the eighth grade of an elementary school and put her into the University of Chicago high school, and she is now at Harvard in the University proper.

In studying this question of elementary education up to the professional schools, universities and high schools, and college work, I think I have had over two thousand graduates from the elementary high school or secondary college course. These are young men and women who have come out of the ordinary walks of life. Most of them have educated themselves, paid their own tuition, largely in preparation for the law. The Chicago Law School is a part of my preliminary educational work. We have in our college work to prepare students for dental and medical colleges, for pharmacy and for the higher universities. I have observed this: It has become a passion with me; it has become an obsession with me to help the poor young fellow out into liberty through the natural sciences, through the English course, through elementary history, through mechanics, and the courses which are taught in our high schools.

I was intensely interested in Dr. Brophy's address from a pedagogical standpoint, and not from the point of view of a lawyer. My business, as I have said, for twenty-five years has been to make lawyers. We have no time to stop to see how lawyers have succeeded.

In the year 1914 we enacted 62,000 laws to cure ills. We passed 31,347 bills and resolutions in congress to cure ills or the bad teeth of this country sociologically. We handed down 45,000 decisions from the courts of last resort to cure the ills of society. Up to 1900 we have passed in this country 750,000 statutes. In 14 years we have passed in the different legislatures and Congress 650,000 laws. All together from the beginning to the present time, we have passed 1,656,000 laws to cure the ills of society. Have we done it? No. We are blankety blank failures. I am leading to a point. What is the cure? There is a mass of unmanageable humanity, and that is the reason why we have war. It is a mass of unmanageable raw material in connection with our industrial wealth. There is war between capital and labor. There is a mass of misapplied knowledge, hence there is a cloud of an ethical nature as to what is the right thing to do. What is the cure? A prominent United States attorney says the cure lies in uniform legislation. Does it? Take the employers liability act. Does it cure it? Take the Interstate Commerce, does it cure it? No. This illustrates what we are up against in regard to the fundamental principles of legislation.

I can answer your question, Dr. Brophy. I have here the curriculum of the Chicago High School. I studied this course all the afternoon. I sent you, Dr. Brophy, four students last fall, and I believe Mr. Downey examined them, and he can answer for himself. There were 120 hours devoted to the study of each subject in preparation for entrance to your college. On page 37 a list of optional subjects is given by the Chicago high schools, and what are they? Every single subject that you require for entrance into your college is optional. That answers the question. Only seven per cent of our boys remain in our high schools.

Dr. Gallie:

That start in the high school and finish?

Mr. Tobias:

Yes, only seven per cent. Why? It is because these optional subjects which are the things the boys need to enter professional life and make them a living are not taught in the regular course as we have it in the curriculum.

There is another point here. I find from fifty to thirty-three and one-third per cent of the regular curriculum of the Chicago high school is absolutely nil as to practical application. A prominent business man came into my office today when I had this course of study before me. He said, "My boy stopped going to high school because they wanted to teach him the chromatic scale." He said he did not intend for the boy to be a singer. The boy objected to it and told his father that he would rather go to hell first. That is an illustration.

I have in my office over 800 applications for these very courses that are optional. I follow them up. I make note of them and invariably three-quarters of these young men and young women say they cannot get these subjects in a Chicago high school, therefore they are handicapped and the woes of life come to them because they come in competition with university and college bred men in seeking a livelihood.

I have made it a rule, with due deference to the high schools, to seek preliminary examiners forty or fifty miles outside of Chicago. in order to get a fair examination, and after our students have been from three to six months or a year in the class they shall be examined by a disinterested high school principal who lives forty or fifty miles from Chicago, so that the examination is thorough and fair technically. I have done that for twenty years. I find as the result, and Profesor Downey will bear me out in part, that this brings about what? Concentration of the student body and the individual pupil upon one subject. To illustrate: We have in our winter and in our spring classes English literature, English history, logic or algebra, and bar everything else.

Why did I take my daughter out of the elementary school? Because she was being taught fourteen different subjects in one week. The end was physical death and spiritual lethargy. I followed that girl through the University High School and in the presence of Dean Johnson and President Judson said, "You are wrecking my girl physically because of what you are doing with her. Stop it." And they did stop it because they were piling upon that girl's mind and heart and conscience too large a number of subjects. She came out fairly well in body, but with one condition for Harvard and that was on physics. We taught physics for six months, using the same text book as the University of Chicago uses in its laboratory work, and when she took her examination for the purpose of passing it, she said, "You will excuse me, I cannot pass it." Why? Because she had six or eight other subjects while she was studying physics. The high school had depleted her. It discouraged her. It destroyed her physical energy to do the thing which she had in view, and that is the difficulty with all high school students. They are nervously depleted and discouraged, and failures physically before they come to you because of this misapplied knowledge. Out of 29 subjects which may be taken for the preparatory education for law we have taken 16 units and shut out everything else, and we concentrate. What are they? Grammar, composition, rhetoric, English and American literature, ancient and medieval, modern history, English history, United States history, physics, physical geography, geometry, civil government, political economy, Latin, German and French.

Now then, with elementary chemistry, what is the result? Out of 35 examinations after a term of three to six months, 12 failed. They failed in the examination which was conducted by a man from Elgin, the principal of a high school, who knew nothing about our system of education. He conducted the examination without a knowledge of anyone else, and that was the result. He was graduated from a high school in the State of Illinois and from the University of Illinois, is a thorough instructor and scholar. That has been the result for twenty-one years. I believe I can see a way out of this.

I am surprised at some of the conditions you make for entrance. Why should a man study astronomy or agriculture to enter your college? I would not have been surprised if you required that he should study meteorology and possibly astrology. There is science there. I delivered nineteen lectures in a medical school on the physiology of the brain and spinal cord, and how the physician should approach his patient from a psychological standpoint, how he should get at the mind of the patient before he begins to treat him. Astrology has something to do with it. Ask Attorney Forrest whether it does or not. Understand, I am not speaking in favor of it. As I have said, I would not have been surprised if I had seen meteorology required as a study before entrance to your college, but I am surprised to see agriculture and astronomy. What has heat to do with bad teeth? This is common sense, and so I am asking these questions to find out what you are driving at. I am asking you these questions because I expect to send you students for the purpose of matriculating them. But I cannot understand why these conditions prevail.

I am delighted to be with you—delighted because I have learned much I have been looking for in the last twenty-five years concerning why certain men should prepare themselves for the practice of dental surgery, and I congratulate you on having heard such a classic paper from a master mind.

MR. PETER DOWNEY: I would like to air my notions on the secondary school work, but my judgment tells me I should not do that.

The last word has not been said about the teaching of young people. I have been in the school business all my life, and the longer I live the less I believe in the knowledge *per se* that you get in your recitation in high school or anywhere else. I offered a dollar reward to an intellectual body, such as I am looking at now, to take a pencil and a piece of paper and write one thing they could remember they ever learned in the eighth grade when they were mature men and women. When you stop and think for a moment, how can you get up and say I remember the day I learned this or that. Write for me, "I remember Miss Lizzie Smith asking me so-and-so and I told her that or this." How many of you can tell me anything? Do you remember anything of what you did on a Friday afternoon in those days? Did you ever see anybody that could? O. T. Bright said, "God Almighty has made us so that we can forget." Do you remember everything you ever learned? If you do, what a sack you would be. Education is a scaffolding; it is not lugging around a reservoir of facts. But I must not continue to talk on that line.

I am an examiner under the laws of the great state of Illinois, and whether the laws prepared by dentists are good, bad or indifferent, it is not for me to say. So far as I am personally concerned, outside of my ambition to have good men go into the professions, I delight in helping boys and girls along in the world. My whole business is in being confronted by children, those bundles of possibility headed toward Eternity, and I am a Christian man. What can I as a teaching agency do to increase the manhood of that boy and the womanhood of that girl? That is the question. Education surely, for the intellect can do as one great man said, "make the efficient fellow figure himself into the penitentiary and to read himself to hell." Right along this line I would like to give you my idea of the Chicago bandits. I am not going to inveigh against the tremendous pressure for the intellectual creature only and the tendency which today is wholly for the brainy man.

Only a few days ago I was astonished at the statement of an intelligent member of your profession when he said, "Do you know, there is no profesion in the world that stands as high as the dental profession because of the exposure to temptation and the resistance." I said to him, we have had examinations today and yesterday in the Englewood High School and we examined 57 men for your school yesterday, and today we examined men for medical schools. Do you know they were walking up and down the corridors where there were 1,700 or 1,800 Chicago children in that sensitive and impressionable period of life who go to high school. We watched these men like hawks—men who are candidates for the sickroom; men who are candidates for the dentist's chair, simply to protect that situation. But now, when it comes to the examination we are limited to tests of knowledge of subject matter, and that is the end of it.

An assistant said to me, "who is that man holding a red penholder and sticking the pen into the ink well?" I told him I did not know, but he said he is a professional bartender and has been a bartender for nine years. I said that is nothing against him; it is the sober side of the bar. (Laughter.) We simply know just that much about these men that we examine. That is the kind of examination you get now. There is no more going outside of that one path. The work of the Board of Regents of New York State is leading to the one thing of limiting the whole professional life to that creature that can hold a lot of subject matter long enough to dump it upon an examining board.

I have been urging good honest boys to go to this and that school to get such a book and see such a teacher, telling them to tell the teacher I sent them. I tell these boys they can work in the day time and study at night. I have piloted a great many boys, and that is my obsession.

Why does the State exact that kind of an examination? There are many people who want me to explain why this kind of examination is exacted. Let me tell you; I believe I can. I take it, every man in this room realizes the fact that every life consists in fighting against limitations. Am I right? You men know tonight that you have some "if" up before you. You will have some "if" tomorrow, pushing back your limitations. What is the reason then we are so limited? We are under bondage to something. Under bondage of what? You may be under bondage of ill health. You cannot go around. You may be under bondage of a lack of some of your special senses. You may be under the bondage of financial embarrassment. You may be under the bondage of domestic difficulties. You may be under the bondage of a very unfortunate personality. You may be under the bondage of this, that or the other things. But the state dare not examine all those things that go to make a great and successful professional man. If it did, it would be a tyrant. Do you suppose that you can tell by a little examination in agriculture or astronomy or astrology whether this or that fellow is going to make a good dentist? It would be quite a job to tell that. As members of a democracy you resent government interference in your own affairs. It is tyranny. So the state simply says we will conduct the examination in a certain way. What way? Examine men in all those things that go to make up the all-around successful professional man. The state selects out of these various things the one indispensable thing—the one that you cannot go on without. You may have the others.

A beautiful woman came into our office at one time and said, "I have been such and such a teacher in the Denver High School and am seeking a position." I said to her, "I am looking for a high school teacher." She said, "Let me have the position, please; I am a very successful teacher." I replied, "I do not believe you could fill the bill." She answered, "I certainly can, I assure you, if you give me the opportunity." I said, "You must teach Spanish." "Oh," she said, "I cannot take the place." With all the other equipments she could not teach Spanish and she did not get the job. If you have not got certain scholastic attainments, you cannot be a dentist, a lawyer, or anything else, no matter if you are the finest looking man that ever stood up. If you cannot read and write you cannot go to a dental school. If you can fill teeth and make them more beautiful than they have ever been made, you will not be admitted without that necesary preliminary education. That is the indispensable thing.

The State says we will test the applicant on this or that, and we will stop there and leave it to the law of natural selection, to the survival of the fittest, to finally decide whether he shall be a good dentist or not.

Why do we give examinations in agriculture or in arithmetic? It does not make any difference to us what they want. The law says we must examine students on the subjects taught in the standard high schools, whether the students come from Russia, Buenos Aires, Cape of Good Hope, Mississippi, or Edinburgh, Scotland.

I do not know who wrote the law, but we are operating under it, and when a candidate is proficient in fifteen of these units he gets a certificate.

If we send to you an intellectual lummox you must not blame us. (Laughter.) If you get a creature that is brainy, full of facts, who can unload them on a piece of paper, that man is entitled to enter your school; but the noble, blue-eyed, clear-skin American boy from the Western prairie must go back home. That is the law. We cannot feel their pulse; we cannot look at their tongues, and we cannot take the temperature.

I would like to be able to tell you as an individual what I enjoy. I would like to study these fellows. I said, to a big Dakota boy, "Do you think you can be a dentist?" "Well," he said, "I believe I can." I said, "Show me your hands." He showed me his hands and they loked like mats. How he would ever get along as a dentist, I do not know.

There is nothing new to tell you. We are proceeding along the line of public examinations, such as the Board of Regents of the State of New York require, and such as all apostles of written examinations insist upon, namely, these examinations shall be written and shall be preserved as public documents, so that everybody may know what is going on. Did you ever examine a man in a room alone? If you have done that, you are likely to be accused of grafting. You have got to stop that or they will say you are crooked. So now, nothing goes but written, published, clean, examinations. There is no nonesense and you will get the product of these examinations so far as we are concerned.

DR. C. R. E. KOCH:

I have listened to the very scholarly and very searching address of our President, to his review of the history and development of dental school education, and the prospective four-year course. I have been delighted with the remarks of the Superintendent of Public Instruction who gives us the promise that high school education shall really educate and prepare the student for his life work.

We have listened to a gentleman who speaks for the law school, with his twenty-one years of training students, and not only that, we have listened to our dear old friend, Professor Downey.

As to the question of the present statute of Illinois and its provisions, I feel in a measure guilty and responsible for it. I did not do it all alone, but I helped to do it, and the object was not to prevent some one from being admitted to a dental school, but it was to help those who are qualified and claim to be qualified, who claimed to have obtained the equivalent of a high school education, to give them a chance for entrance into the dental profession, and the law enacted now and placed upon the statute has for a number of years been in practical use as a matter of rule of the State Board. The board itself is appointed and is politically a creative body from time to time, subject to changes in quality and worthiness. Those who have known Mr. Downey have admired him for his sterling qualities, his good hard sense in educational matters and his excellent judgment in the selection of the people to whom he has given certificates in the past. Nevertheless I have sympathized with him frequently because of the nasty things that have been said about him and about the methods which laid him liable to all these things. He is relieved of all that now. He divides the responsibility with the Superintendent of Public Instruction. The highest educational authority in his wisdom has seen fit under the law to give the instructions that in some respects seemed to be amenable to the criticism of my friend, Mr. Tobias. I am not responsible for that. The dental profession is not responsible for it. Mr. Downey is not responsible for it. It is the system that is responsible for it. We must meet that system and labor under it, so that no young man, who has ambition and ability, shall be disqualified from entering a dental school. That is the only way in which we can do it. All over the world it is now required that a man shall have completed his secondary school education before he is eligible to enter a professional school of any kind. Whether this examination is worse or better than the other is a question of opinion and it is too early to determine. It has not been tried long enough. I am inclined to think it will be better. I am free to express that opinion. I think we will get better and safer results, and all these innuendoes of selfish interest, of grafting are without real foundation.

Mr. Downey:

Please tell me the proportion of efficiency that the mental or intellectual has to the physical or manual in your profession.

Dr. Koch:

I am free to admit both of them have. The high school does not take any cognizance of anything except scholastic attainments, and how can we expect any other body to determine that condition? It is the system. If the high schools can do what the superintendent has intimated he would do, we will make a very extensive step towards progress. But we are forgetting. When we talk here we are not talking about Chicago high schools; we are not talking about Illinois schools, particularly. The whole boundless universe comes and worships at the shrine of the dental schools of Chicago, and we must have standards that can be uniform and that can be applied alike to men, no matter where they come from.

Only today I was in a quandary in regard to a Canadian application and Canadian credits. In Canada the system of measurement is entirely different from ours, yet I believe I can say truthfully that the Canadian system of secondary education does more educating than ours does, yet when you get a credential you do not know what to do because it is expressed in language and a standard of measurement we do not understand, and we do not have it. Those are all questions that confront the man who has charge of the school entrance requirements, and he is up against them good and hard. Mr. Downey may deplore the fact that we only have a right to measure a man's mental capacity with reference to the subjects that he chooses to be examined in. If they find him competent in fifteen high school units, optional, they must give him a certificate, enumerating the subjects. But bless your heart, Mr. Downey, that is all the high school principal does. We do not pay any attention to the diploma of a high school any more. We make the high school principal give us a certificate of what that man or this man did in four years, what subjects he studied, and what his courses were. Still it is the same thing as yours when you reduce it to the ultimate analysis. But these are all subjects that are settled for the time being. The law has been enforced such a short time that the full development of it has not been achieved. I have no doubt that the board will find a way to disqualify a man just the same as a faculty does.

So far as the work of Mr. Downey is concerned, it is one of individual conscience. He stands at the gate just the same as any other teacher does. The teacher issues a certificate of a man's moral conduct and standing. He knows whether a man is qualified or should be disqualified.

MR. DOWNEY:

We have no way of doing that in all cases.

DR. KOCH:

Perhaps not, but the high school principal has the opportunity of watching these boys for years and is in a position to tell about the moral conduct and standing of them. Many of the professors in colleges and universities hold that there is absolutely no other way of accepting a man unless he goes through with a completed secondary school education that is given in accredited schools which are recognized, or else he must submit to an examination in every subject before that university accepts him, and they do not recognize any intermediate power, although it may be created by an act of law.

Let me now revert to the proposition of the four years' course. The four-year course is intended—at least, that is my conception of it—to give the student more time to digest more thoroughly, to assimilate more thoroughly, things that were taught him both mentally and manually, and any subject that will make the work more effective and meet any deficiency he may have in the start is proper in my humble opinion. The only real question that seems to be in doubt is the one of an optional year of English. I do not believe there is a man who has ever marked a set of papers at the end of a school course, even though it be written by a high school graduate, who has not deplored the fact that the man who wrote that examination did not thoroughly grasp the subjects on which he wrote and could not and did not express it in language of his own, conveying his own thoughts. It is usually perverted English copying or repeating what somebody has said and sometimes getting it mixed.

The older I get and the more experience I acquire in this work, the more I feel that we ought to give these fellows something supplementary. It is true, you may think a man is not fit for it. Let him stay out another year and become more proficient while he is getting English or is getting some other thing and getting better prepared to meet the responsibility of a profesisonal man and a professional gentleman. It may be all right to say that the fellow who expresses himself ungramatically may preserve the teeth as well as some other man, but he does not have the same amount of influence, he does not build up the same amount of respect for the profession and make it as useful to mankind as the man who can talk intelligently, correctly and impressively.

As to the question of the four-year curriculum, I say it with all due respect to our worthy President, in the ultimate analysis it is one which each school will have to solve for itself within certain limitations, and it will become responsible to the public, to its graduates, and to its alumni, whether it is doing the work well or otherwise. It will be another experiment in dental education, and I hope there will be no one pointing the finger of scorn to his brother because he is serving the pabulum in a little different style from the other one.

(*To be continued.*)

ILLINOIS STATE DENTAL SOCIETY.

FIFTY-SECOND ANNUAL MEETING, HELD AT SPRINGFIELD, MAY 9-12, 1916.

DISCUSSION OF THE PRESIDENT'S ADDRESS.*

Dr. Donald M. Gallie (Chicago):

Mr. Chairman, Dr. Buckley, Members and Friends of the State Society—I am sure I speak for everyone present this morning when I say we should feel proud that we are American citizens, proud that we are living in the great State of Illinois, that we are members of a profession that has made a name for Illinois, and that we have presiding during the sessions of this convention a man of such ability as our President. (Applause.) I want to thank Dr. Buckley and compliment him upon presenting as his message a theme that did not deal entirely with some specific line of work, but that he has taken in the great activities of the times and of the profession, and I want to thank him for inviting me to open the discussion of his address, because I have had some opportunity of seeing what has been done in the last two years, especially along the line that he emphasizes.

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*This address appeared in our June issue.

Last year, as President of the National Dental Association, I was in close touch with the State societies and, of course, with the local societies, as they are component parts of the State societies, and I had a good chance to see and know what the different States in the Union were doing. And this year I have had an advantage which I have enjoyed to the fullest—that of going to different parts of this country to the dental schools. I have visited sixteen or seventeen dental colleges this year and have had some chance to see what the great educational institutions of our profession are doing and are arranging to do in the near future. So it is a pleasure to have the opportunity of discussing this excellent address.

He starts out by speaking of the great responsibility that we of the dental profession must assume, and he says there is no doubt—and I can corroborate that from what I have seen in the last two years—that the dental profession realizes its responsibilities, and is preparing to perfect its organization in every state and assume the responsibility, accept the challenge, if you may call it, as to doing our duty. Dr. Barcus said it is dangerous to mention names when there are so many who have done so much for dentistry, and when Dr. Buckley spoke of the work going on throughout the country, I wondered if there were not some present who feel that perhaps Illinois has not been doing all she could or should do in keeping up with this great professional activity throughout the whole country. No one appreciates more than I the great work our dental society has done, and the record this society has made, and I give way to no one in my praise of the work done; those who know me, I think, know that I am not a pessimist, but an optimist—but I want to say that Illinois must wake up and be alert if she expects to hold her place as leader of state societies. I can remember the time when we had three or four hundred members, and we would bring down one hundred to one hundred and twenty to the meeting on the night train from Chicago. Now we have eighteen or nineteen hundred members, and last night we brought down fifty-six or sixty from Chicago. And our attendance this morning is not what it should be.

At the Ohio State meeting last December nine hundred to one thousand men were in attendance; the meetings were called to order at nine and at two, and if you were fifteen minutes late there was no seat for you. Dr. Buckley has told you of the wonderfully interesting meeting held at Kansas City, where one thousand men came from great distances and paid $5.00 extra to find out about the sciences underlying our profession, the foundation on which our profession is built. And so I want to remind you that we cannot live on our record of the past, and not altogether on what we are doing at the present time. We must look into the future and keep moving if we are to keep up with the other states in the Union.

I was not surprised to hear Dr. Buckley start in, after his splendid opening remarks, with that part of our work that is so essential—the treatment of the teeth for the reception of whatever may follow, whether it be inlay, bridge or filling. He speaks of the fact that today the medical profession is safe if they only follow the advice of such men as Murphy, the Mayos, Crile, and other medical leaders, and the dental profession is safe if we only follow the advice of the men whose names he mentions. That is true, but we must not forget that our profession is not following the advice of these men as closely as they should, and today we find men who are advocating a line of work that will only bring discredit and disrepute upon the profession. I have been impressed with this during the last two years in attending a great number of meetings. A great number of our profession do not realize that the most important thing today is the treatment of pulpless teeth. Too many are still advocating the retention of teeth that have been over-treated or are beyond treatment, when the only thing that is safe would be their removal. Dr. Buckley's reminder is indeed timely, and this warning he is sounding before the Illinois State

Society is being sounded before all the different societies that meet during the year, and we know it is bound to result in much good.

On the question of commercialism, I think Dr. Buckley has covered it so well that there is little to be said. I do not believe any of us wish to discourage the man who has given time, money and his best efforts to produce something that will aid us in the great work we are striving to perform; I think we all appreciate the fact that the man who gives his time, who sacrifices his family, home comforts and everything else that goes to make life worth living, should receive in some way compensation for his labor and ingenuity. But that is not the dangerous commercialism that is facing the dental profession today. It is the man who in his office —and this is true in every state—is commercializing and capitalizing the fear of the patient. We have in Chicago an army of such men—kid glove fakirs. I have a patient, a man of excellent type, whose teeth were in such condition that practically the only thing I could recommend was the use of the forceps from start to finish. I could not convince him that extraction was the best remedy. He came back one day and said: "I was just talking to a friend of mine and his mouth is in much worse condition than mine, and his dentist is saving his teeth and says they will last for years and years. He tells me that his dentist says the trouble with the dental profession is that they do not read and study. This dentist has been in Africa and all over the world studying the primitive races and out at his home he has a small zoo where he can experiment on the animals." This wizard poses as one of our leading men.

Many of our dental societies are not blameless, they encourage the worst brand of commercialism. Many of our best men are invited to read papers before societies. They often pay their own railroad fare and hotel expenses, they give the society their best thought and best effort and the attendance will be small. These same societies will get a fakir from Chicago or New York or some other big center and pay him one hundred dollars and his expenses to tell them how to build up their practice, how to indulge in selling talk and how to get the money. Talk about commercialism! Selling talk is what he is giving you—and you pay him one hundred dollars—some fellow who never had a practice of $3,000 a year in his life.

Now as to National Relief. I am somewhat familiar with that.

A year ago we met at Ann Arbor, and dear old Dr. Gaylord of Connecticut almost despaired of making a success of this work which was started by Dr. Noel of Nashville, Tenn., but a thorough discussion of the subject convinced all present that another effort should be made to keep up this splendid work. As you know, a respectable sum was left over from the San Francisco fund, and this was a good start and they have added a little, but so little that it has not been creditable to the profession we represent. Dr. Gaylord told me the percentage of men who sent back the dollar's worth of seals rather than pay the dollar. It is a disgrace to the profession of dentistry to have such evidence of indifference to the comfort and consideration of some of the great men who have done so much—just the type of men Doctor Buckley speaks of—who gave the best they had and did not have a chance to save for the rainy day and old age. And surely this appeal will not go unheeded today. Everyone will take the stamps when they are sent out and send back for more.

I want to thank Dr. Buckley for speaking so well and at such length upon the question of the National Research Commission of the National Dental Association. You men must realize that the National Dental Association is your association. A few years ago it did not represent the profession of America, but today, through the efforts of our State of Illinois and men who are active in reorganization plans, followed by the other states in the Union—we have a great organization, one of the greatest in the land, made up of practically every state and local society in the country. No matter how small the hamlet may be, how remote a man may be from the great centers, he is part of the National Association--which is made up of the state and local societies. So no one can feel that he is not a part of the National Association, and every one should feel at this time that he should do something towards solving the great problems that confront us. How are they to be solved? You cannot do it individually and so it must be done by an organizaion, and this organization, started at Kansas City, has gathered momentum and has reached a stage far beyond our fondest expectations. I wish everyone here could go to Cleveland and visit the home of the National Research Foundation. It is one of the fine buildings in Cleveland, and while built for a private residence, it is well adapted for the purpose for which it was purchased. You can ask any man in Cleveland who knows the values of real estate, and he will tell you it was practically given away. And the work that is being done there I can tell you augurs well for the future and shows that the time is very close when we will have some of these great problems worked out in that great institution by the best research workers from different parts of the country. You remember last year we brought Dr. Price to our meeting and he gave us some idea of the work they were doing, and made an appeal for funds, and as you know, he made a splendid presentation of the subject. He called for help, for subscriptions, and there was a liberal response at that meeting. But when you come to consider what Illinois has done—Illinois, that has always boasted about being prominent in national affairs—the cradle of the best in dentistry—Illinois is away behind many states in her support of the research institute. In the State of Ohio $12,000 was subscribed two years ago. The dentists in Cleveland gave $5,000 toward the building fund. In December at the State meeting in Columbus they contributed $4,000, and they gave something like $1,000 to buy John Callahan an X-ray outfit to carry on his work in Cincinnati. In Iowa this year they have agreed to give one dollar every year per member. And as Dr. Buckley said, these men at Kansas City subscribed $6,500. Illinois has subscribed $5,491, and of that amount $988 is delinquent—and it costs ten per cent to collect it. When we made our appeal here last year we had men that we knew could well afford to give, come up and give one dollar; and then we had men not so well able to give who gave $50, $100 and $250. Gentlemen, I am serious—we must do our share in aiding this splendid work. The time has passed when we can hold back and find fault. Other states are recognizing the value of this institution and are supporting it liberally. We must do the same.

I was glad to hear Dr. Buckley suggest to this society the starting of a Black Memorial. I was present at the unveiling of the Miller Memorial in Columbus during the state meeting. It was a great occasion; there were men there from all over the country, and the man who suggested that memorial was our great Dr. Black's son, Arthur. I am glad that the President suggested that we in the State Society by some means show to the dental world that Illinois does nct forget the value of the man who worked for us, lived with us, and died among us. I am sure with the start it will get in the home state other states will gladly join.

I am pleased that the President spoke of the great endowed institutions and the wonderful work they are doing. A few days ago I met at a luncheon a man who is doing a wonderful work along the line of preventive dentistry, Mr. Fones, of Bridgeport, Conn., especially taking care of children's teeth. He gave us some idea of the work that is being done by the dentists of the country, but he said the percentage reached was so small that the wonder is how we are going to take care of the great masses that are being educated more and more as to the value of dental service, especially when you consider that next year we begin a four years' course, which will interfere with the college output. And when you think of the time and care that must be given to properly treat these diseased teeth, it shows that we must have something more than colleges, we must have something more than active practitioners, we must have institutions similar to the Forsyth in Boston and the Eastman in Rochester, and I have no doubt that the time is near when we will have in many cities men who will endow institutions similar to these.

I never witnessed anything so splendid, I have never seen anything of a national nature which compared to the dedication of the Forsyth institution in Boston a year ago last November. I had the pleasure and honor of making an address on behalf of the dental profesion, and on that occasion all the great prelates, the Governor, the Mayor, the Presidents of Harvard and of Tufts, and other prominent citizens of Boston and its environs, were there. There were between six and seven thousand visiting people during the day, and it showed the great interest it created. I trust there will be a Forsyth or an Eastman in Chicago, and St. Louis, and all the other great cities, because something of this nature must be developed before we can hope to take care of in any adequate way the great demand for dental services that confronts us today.

Then, Mr. President, I want to congratulate you on not forgetting that we have something more to consider in this world than the mere making of a dollar by our chosen calling—that there is something more for the dentist to look forward to than the mere filling of teeth. We are very glad to come to this City of Springfield, the capital of our great commonwealth, and the welcome we have received and the closing note of your address has filled everyone present with patriotic fervor so that we all want to shout Hallelujah! I thank you. (Applause.)

Dr. Arthur D. Black:

Doctor Buckley, Members of the Society: I am sure that we have all been much impressed with this splendid address of our President. It presents much of opportunity and responsibility. These two always go together. There has come to the dental profession the greatest opportunity, I think, that has ever come to such an organization, in the matter of the relationship of mouth infections to general health——opportunity to play our part in the field of medicine in preventing disease, and what is of even more importance than that, in promoting good health. With that opportunity comes responsibility. If we do not realize this responsibility, if we do not accept this opportunity, then we ought to get out of the dental profession, because we are either contributing to the earlier death of our patients, or we must promote their longer health.

It is a situation that is too serious for us to longer set aside as a thing which we need not make a part of our daily practice. Some of us who may have been in closer touch with a considerable number of actual cases in practice have possibly been more deeply impressed with the seriousness of this responsibility and the greatness of this opportunity, and the thought always comes to my mind that if each member of the profession could be brought into contact with the case histories of a few individuals who have come to be seriously sick and could see the recovery of their health as a result of the cleaning of the mouth of infection, they would really appreciate this situation. That was all there was to Hunter's work—purely clinical observations of many such cases.

Now, if it is a fact—which I think no one here today will deny—that these things are so, that dentists have in a limited number of cases succeeded in bringing about better health by cleaning mouths of infection, look beyond that to the opportunity the profession faces by the doing of this thing before disease occurs. The day is coming before very long when every man who is practicing dentistry as he should will learn to make a diagnosis of what is in the patient's mouth—which we are not doing today. That examination of the mouth will not be to look for cavities or pus pockets which are quite apparent to the naked eye, but will be one that is directed primarily to the menace that exists to that individual's health. That is the first thing we ought to think about; we ought to know whether the mouth is clean from infection as a first proposition, and then after that has been settled we may undertake to do what constructive dentistry may be necessary. That is the basis, to my mind, upon which dentistry must be practiced in the future.

If I would in any way criticize the address of our President today, it would be in the few statements which he made—not the statements themselves so much as the idea which I believe they convey to many members of this audience—regarding pulpless teeth. I did not have an opportunity to read the address, so possibly I got a misconception that others did not; but in making his statement regarding the treatment of pulpless teeth in which he said that the problem had been solved, I think many of us probably got the idea that that also included abscessed teeth, which is a different proposition. I cannot bring myself to believe that the work which has been done up to the present time has settled for the profession the treatment of pulpless and abscessed teeth, by any means. The only treatment that we can today apply with certainty of success to chronically abscessed teeth is extraction. But I am not saying that there are not other ways by which these teeth may be treated. We may learn more about them so they will not have to be extracted. I do not believe that Doctor Buckley intended to convey the idea that this situation so far as abscessed teeth are concerned has been cleared up, and I only mention it for fear a considerable number may have gotten that idea.

There are other responsibilities and opportunities presented to us in this address. The solving of most of these by those men who are in practice today can be brought about most effectively by the determination of each man to do a little more of study for himself alone; for each man to take upon himself the responsiblity of knowing more about what has been done; to study things that have been presented to the profession, and to develop the power of discrimination, so that we may determine which things are good and which things are not so good among the tremendous mass of material which comes to us.

I think there is no one condition facing the dental profession today in which this power of discrimination suggested by our President is more important than in the matter of professional commercialism. It is a difficult thing to set down in black and white rules which shall govern the conduct of a man in these things, because it is the motive behind them which is of great importance. One man has a high motive. He gives his time and neglects his practice and does anything and everything that is necessary to carry on a line of work for the good of the profession, for the good of humanity. He is not caring very much what the financial result will be. When it is done it is to be hoped that there will be a financial return for that man which will recompense him for the time expended. Nevertheless he does it with his whole heart because it is something he can give to the profession for what it has given him—for the work of the men who have gone before and have laid the basis upon which he can work—and he does this work regardless of what he is going to get for it.

Compare him with that other man who devotes just as much of his energy and time, but who has no other thought in mind than the money he will get out of it when he can unload it on the profession.

It is pretty hard to separate these two men in black and white. They are both devoting time and energy, but their motives are entirely different, and this is the reason that discrimination among members of the profession is necessary. If the members have the power of discrimination they will settle it for each individual man as to whether or not he is entitled to their full confidence and respect in the work he is doing along whatever line. I think it is the lack of this power of discrimination that has enabled so many fakirs to put over the things they have put over on the profession. During this last winter I spent four weeks on the Pacific Coast. I think there is no field in the United States that has been more thoroughly raked by the fakirs of the dental profession than the Pacific Coast. As a result, the men of the Pacific Coast have gradually cultivated a power of discrimination such as they did not have before, and it has been a good thing, because I think the men who go to the Pacific Coast hereafter will be looked over pretty carefully and will have to conduct themselves along more ethical lines than many who have gone there before. In Chicago we are getting more or less of a taste of this same thing now, and I believe a good many men in Chicago are going to discriminate more carefully than they have heretofore after they have had a little more of the things that some of our men are getting there today.

It is the motive behind these things which we need to look at; that is the thing we need to know, and when we learn to recognize it we will not have much difficulty in classifying the men.

I do not wish to speak longer. I only want to mention—just suggest—a further responsibility and opportunity which Dr. Buckley has mentioned, that of our better citizenship, a thing which professional men need prodding about possibly more than any other group of men. We are inclined, in the very nature of things, to evade civic duties more than most other men, so that especially at this time is it urgent that we should appreciate our responsibilities in this connection and should take a part and do those things which our President has suggested. (Applause.)

Dr. F. E. Roach (Chicago):

Mr. President and Members of the Society—This is a great pleasure, I assure you, to be privileged to discuss the President's address. We are proud, not only of our magnificent society and its membership, but proud of our President and his address. It should be an inspiration to us and help us to retrieve that which we have lost. It has been charged against us that we have lost some of our enthusiasm, some of our progressive spirit, but this address surely will bring us back and put us in a way to continue our work in the progressive manner that we have in the past.

I do not think it necessary for me to take up the subjects treated by the President in his address, but there are a few points that might be of interest to touch upon, and one is our attitude toward men in the profession that are endeavoring along certain lines to do a certain class of work—whether we are inclined to discredit these men, whether we are inclined to give them a place in the profession, and how we are going to classify and place them. I was very much pleased at Doctor Black's remarks in reference to this classification—that it is going to be a matter for us to decide upon. There are no two of us identical in our temperament—we have our various gifts or abilities. We have those who are gifted in writing, and what would our profession be without those men who are able to write, who enjoy writing, and who record the things that are being done in dentistry, and put into readable form the work of the men in the profession in a way that makes these writings something valuable to refer to. We cannot do without these men; they have their place. Here are other men gifted along lines of scientific investigation, men that enjoy that work and do it better than someone else. We must have all these men; they fill their place in the great work of this profession. There is a wide field to be covered. We have our men that make a study of surgery, orthodontia, therapeutics, etc. No one is trying to discredit the work done by Doctor Buckley, Doctor Johnson, Doctor Gilmer, and other men along particular lines.

There is another clas of men that like to spend their time and enjoy work along the line of invention. There is no profession, or calling, in which the inventive mind is more needed than in dentistry, for after all our work is so largely mechanical that there is a demand for mechanical devices. We are not all G. V. Blacks, a master practically in every department, not only scientific investigator, but writer and inventor. These men are so rare that a life time only yields one such.

Then let us take a broader view of these things and not discredit these men. The commercial world, honors and gives the greatest encouragement to the inventive mind. Let us give them an opportunity, and encouragement. I am willing and glad to give such men as Taggart all the credit in the world that a man can express and show to a man of that type. What would we do without the casting process today? I am willing to do this man honor, and I am willing to pay out of my very much increased income the small and very meager amount demanded for this great gift to the profession. Why should we withhold what he is entitled to for giving us the best of his life? Let us not be selfish about these things. Let us give a man full credit for what he has done, and due honor, and if necessary let him have a fair compensation in worldly goods besides.

That is my view of these things. There is no one that is more uncompromisingly against the charlatan, the quack, the fakir, and those who want to commercialize our profession. Doctor Gallie spoke about the "kid glove," and "silk stocking" fakirs, and they are all through not only the dental profession but the medical profession—men that are not honest with their people, that are taking advantage of every opportunity to humbug the people. If we can in some way eradicate these men from our midst I think we will be doing a better work than to try to discredit and throw impediments in the way of men that are trying in an honest way to better our equipment, better our materials or our methods of practice in order that we may do our work easier and better, conserving our own energies and the best interests of our patients. That is the one thing in this address that appeals to me particularly more than others. I am heartily in accord with all the president has said, and I am sure we can all gain new inspiration by these broader views of the various phases of our profession. I thank you.

Dr. C. N. Johnson (Chicago):

Mr. President, Doctor Buckley, Ladies and Gentlemen: The time is late and I shall try to be brief. I have been impressed, as you all have, with this inspiring address of the President. I have also enjoyed very much the discussion. Doctor Gallie touched upon the subject that is very important, and that is the status of the dental profession of the State of Illinois. At the fiftieth anniversary in Chicago, when this Society seemed to reach the zenith of everything in professional association work, I made a statement to the effect that I had a great deal of anxiety for this Society; that I believed it had arrived at a dangerous period; that the danger point of any organization, or any man, or any community, or any nation, was when that nation, or community, or man, or organization should consider itself at the top; that I thought it was a dangerous position for us to take, and I have discouraged men from other states making such a statement in regard to the Illinois Society. I said at that meeting that I feared we would lose our enthusiasm, that we might feel the goal had been reached. What Doctor Gallie has said today has too much of truth in it. We must take a new interest in our Society if we are to keep in the vanguard.

Doctor Black said that the advance in the future must be an advance of the individual, and the advance of the individual man comes not so much from this large organization as from the smaller ones—the study clubs. The greatest good to the individual is always obtained by getting down to the close work with fellow members in small organizations. I believe if we can keep up the interest in study clubs we will do an immense amount of good. We need our large organizations, we need a society like this for the inspiration it gives. There is an impetus in numbers, and we need that; but we need in addition the smaller organizations where men get together in the laboratory and discuss in a close, personal way all these problems that meet us each day.

I want to say a word in regard to what has been done by the relief organization which was started by Doctor Noel of Nashville, Tennessee. Doctor Gallie said that some members sent the seals back without the dollar, but some sent back the dollar and asked for more seals. You do not enrich yourself by refusing to give to others. You build yourself up by giving and by helping others, and I hope when these seals are sent into Illinois next Christmas that many will send back for more seals.

I would like to have just a moment, if I may, to say something about the research work. There is a feature that I do not believe is sufficiently understood by the profession. Just so soon as we prove that we are willing to put our shoulder to the wheel and raise a fund commensurate with the number of men in the dental profession, just so soon will we find wealthy people who are willing to furnish the money needed to carry on these investigations in the way they should be carried on. (Applause.) Whenever we prove to the moneyed people that we are in earnest about this movement, there are millions of dollars waiting to be put into it. This money is not only for the benefit of the dental profession, but for the benefit of the world at large.

Now, one word more in regard to the latter part of Doctor Buckley's address, where he says that we as a profession need a new sense of our greater citizenship. There never was a time in the history of the world when there was such a serious condition as we have today, and yet it does seem to me that there never was a time in our own country when there was so much frivolity and thoughtlessness, so much dissipation and unrest as we have today. We should think seriously of these things. We are no longer simply one country without any relation to the rest of the world. That time has gone. You may talk about the Monroe Doctrine or any other, but we can no longer divorce ourselves and our interests from those of the entire world, and it behooves American citizens today to think seriously of conditions as they are—and not follow the false gods of frivolity to the extent they are doing today.

Dr. J. P. Buckley (closing):

Ladies and Gentlemen: The hour is late and I do not want to say a single word except to thank you—the audience for your kindness in listening to my address and remaining for the discussion, and especially the men who have taken part in the discussion. I thank you.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held March 7, 1916, with the President, Dr. P. J. Kester, in the chair.

Dr. F. H. Harms of Chicago spoke on the "Bacteriology of Pyorrhea and Abscesses of Teeth and Jaws."

His remarks were illustrated by microscopic slides and exhibition of cultures.

Dr. Harms said:

I had understood from your Secretary, Dr. Davis, that this was to be simply an informal talk, so I have not prepared any set speech, but will try in a few words to cover the experience we have had recently in our bacteriological work with cases of pyorrhea. The subject of the ameba I will put aside, as you are more familiar with it than I am.

I reviewed, before coming to this meeting, an article by Craig in which he casts serious doubt on the endameba as being the real etiologic factor in pyorrhea, so that bacteriologic examination is more important for the purpose of investigation. I shall take up not only the question of etiology of pyorrhea, but that of abscesses of the jaw, and what we medical men are more interested in, namely, the constitutional conditions resulting from such a disease.

The bacteriologic work runs back some years, but there was no definite study of the bacteriology of pyorrhea and abscesses of the jaw until about two years ago, when Gilmer and Moody published a paper in which they gave some definite statistics and experiments on abscesses of the teeth and jaws. In their paper they found principally an organism of the streptococcus type which on a blood agar plate gives a green color to the colony. The streptococcus itself on plate culture was the characteristic streptococcus pyogenes; but they found in addition a hemolytic streptococcus, and in some cases the pneumococcus, aside from organisms which we now consider as saprophytes, spirilli, and others. But in all cases, where the bacteriologic work was done carefully, they were able to exclude all organisms except those three, with the principal stress being placed on the streptococcus viridans, the second most important being the hemolytic streptococcus and in acute cases the pneumococcus.

Following that was the work in Minnesota by Hartzell and Henrici, which was published in the Journal of the American Medical Association, March 27, 1915. They carried on a large series of experiments, made many cultures, and found when an abscess was properly approached, that is, when the surface was properly sterilized and cauterized with the actual cautery and opened under aseptic conditions and cultures made, these abscesses, especially at the root of the teeth, would give practically uniformly streptococcus viridans. They were unable to find the pneumococcus at all, and rarely the hemolytic streptococcus. There were obtained in a few instances cultures of other organisms, such as the staphylococcus albus. In a very few instances they found the proteus vulgaris, the bacillus subtilis, pyocaneus, a Gram positive bacillus and the diphtheroid bacillus, but those only in isolated cases. The streptococcus was always present even in those.

As for the systemic conditions in cases suffering with pyorrhea and abscesses of the jaw, they found especially acute and chronic rheumatism, endocarditis, two cases of streptococcemia, cases of pernicious anemia, gastric ulcer, and acute iritis. In these cases the abscess cavities were removed, the teeth extracted, and in a large number a cure of the systemic condition was obtained. For instance, in acute and chronic rheumatism they found in over half of the cases there was a marked improvement; some were completely cured, but over one-half showed marked improvement. They did not have so many cases of endocarditis; perhaps five in all. Of these two were vastly improved. The two cases of streptococcemia they were able to trace directly to the mouth infection. In one of these two cases they found definitely an endocarditis. In the pernicious anemia cases they had one case, after removing pus pockets, in which they had very marked improvement. In the gastric ulcer cases, by removing the infection in the mouth they were able to clear up the symptoms completely without any recurrence. In the acute iritis cases they noticed a marked improvement.

The method they pursued was, as I explained before, to sterilize the mouth carefully, even using the actual cautery, removing the teeth, and cauterizing the rest of the teeth, except the tip of the root.

This was cut off with forceps and placed with sterile forceps into bouillon. In all cases they found the streptococcus viridans. They were unable to get many healthy teeth, as might be imagined, for control purposes. But cultures of a few which they were able to remove under these conditions in all cases remained sterile. They did not find the hemolytic streptococcus. Cultures obtained and inoculated into animals experimentally reproduced the condition. They inoculated in all some twenty-four animals and were able to reproduce in the rabbit a lesion of the heart in five cases, lesions of the kidney similar to those obtained in rheumatism in 7 cases, typical lesions of the aorta in 3 cases, and 2 cases of joint infection.

The streptococcus viridans was formerly considered a harmless organism and is yet in most cases—a saprophyte almost. In fact, it is found in the mouth practically always in most healthy individuals. In making smears a few years back, when we saw a streptococcus of this type, the organisms being arranged in pairs, we considered them as simply saprophytic and overlooked them, disregarded them, and centered our attention upon the typical pyogenes in which the individual cocci are of the same size, not in pairs and forming a perfect chain, like a chain of beads.

We now know the streptococcus viridans changes its virulence. It can become a very virulent organism. In fact, in endocarditis it can become so virulent that it is not infrequently fatal. It can be recovered from blood cultures.

The conclusion that Hartzell and Henrici came to is that this organism is one which closely resembles that obtained in cases of rheumatism.

In the second communication by Hartzell, published in the Journal of the American Medical Association September 25, 1915, he gives additional facts. He shows that the streptococcus viridans is not only found in the abscess itself but in the peridental tissue as well. He draws conclusions in the treatment from two cases in which there was streptococcemia, a generalized streptococcus infection, due to the fact that too many of these abscess cavities were opened at one time. He points out that the cavities should be opened at intervals of from three to six days. That is the period in which the positive phase, speaking in terms of Wright, is the highest. At the end of five days you will find the blood full of antibodies, and evacuating the abscess cavity at that time will not result in any bad effect because the resistance is at its highest.

I will show you how we make these cultures. For experimental purposes it is absolutely necessary to exclude all other organisms. The technic they describe is a very rigid one and we cannot find any fault with it, but for practical purposes we cannot do that in the laboratory. We found that it suffices simply to express all the pus we can from about the tooth or teeth because as Hartzell points out the same organism is found in the peridental tissues and comes to the surface in the pus that oozes out. This we put on human blood agar plates and spread with a spreader over the surface. I have been able to get since Friday four plates, three from patients that came to the laboratory for vaccines, and one patient whom Dr. Davis sent over. I will show you these plates and you will see in all of them the same organisms in predominating numbers. The other inhabitants of the mouth will be found there also, but for practical purposes they do not make any difference. We can pick out the streptococcus viridans colonies and transmit them to different media. They grow especially well in bouillon or on blood agar slants, and they are green. The peculiar thing about the organism on culture is this: You make a culture and make a transplant, and the transplant may or may not grow. Usually the first transplant grows pretty well, while the second may die off. In other words, they are not as easily handled as ordinary streptococcus pyogenes, although in some cases you get a beautiful and characteristic growth.

For the making of a vaccine these bouillon cultures are centrifuged and the sediment suspended in salt solution. From the solid medium the organisms are scraped off and put in a suspension and centrifuged and resuspended in salt solution, and then are killed and used for vaccine purposes.

In speaking of the value of vaccines in the treatment, the point made clear is that the actual curettement of the cavities gives excellent results. One of the principal reasons is that you have auto-inoculation produced in that way of the actual organism which is producing the lesion. Hartzell says, however, that in case curettement alone will not produce the end results, the vaccine is a good auxiliary, although he does not believe the vaccine alone will cure the condition. Then, of course, actual curetting of the cavities also produces good drainage and in that way prevents infection from constantly getting into the system.

I have the plates here and I have also the slides. I have brought with me some of the slides showing the ameba if anyone cares to see them. I have three or four such slides which show the ameba beautifully. I have also slides of the streptococcus viridans made from one of the plates I have shown. In looking at these organisms on blood agar plates you get the color effect by holding it off a little bit slanting. The colonies are very small, they are just like very fine dew drops, around each colony there is this greenish zone. I find the hemolytic streptococcus as well as the viridans. The pneumococcus colony shows a little larger, and the ring of green is larger, more decided, whereas the ring in the streptococcus viridans type shows some hemolysis. The striking thing about it is if you make a plate and incubate for twenty-four hours the viridans will show a beautiful green ring about it, then if you allow the plate to stand for two or three days the greenish color disappears and the hemolytic quality becomes much more evident and there is a zone of hemolysis around it. It partakes more of the characteristics of the hemolytic streptococcus.

By complement fixation we are able to tell differences in organisms, using the growth obtained as an antigen on the patient's serum if you get an organism that will fix the complement with the patient's serum, you know you must have the exciting organism.

Another test which is being used is the anaphylaxis test. That consists in making a glycerin emulsion of the organism and vaccinating. With the proper antigen you get a skin reaction very much as you get with the luetin in the luetin test for syphilis or the Von Pirquet in Tuberculosis.

Those are the tests to determine the specificity of the organism for this condition. In the future, I think, instead of determining the streptococcus which you develop, culturally it will be demanded that you either do a complement fixation test or an anaphylaxis test to determine that the organism which you have isolated is the exciting one; because you can get a growth of streptococcus viridans out of any mouth. Simply because you have a growth on the blood agar plate does not mean that you have the organism which is exciting the condition. On the other hand, if you do get the organism which excites the condition you should be able to show it by the anaphylaxis test or the complement fixation test.

There is a striking thing in connection with the work of Rosenow. You can start with a streptococcus of the pyogenes type, the typical hemolytic streptococcus, and by varying the conditions in which you grow it you can gradually change that organism into the streptococcus viridans and continue that on down and change it so that you get a typical, pneumococcus with all the characteristics of the growth and everything else. Beginning at the other end of the chain you can take the pneumococcus and bring it back to a streptococcus.

One of the peculiar factors is the oxygen tension. If you make a blood culture and there is a persistence of the streptococcus viridans, you will find it will grow especially on the blood corpuscles on the floor and not near the surface, or else it will grow in the midst of the coagulated fibrin and not in the fluid itself, and it is only by putting it in a similar condition that you get the transplant to grow. If you transplant directly on an agar plate, so that it is exposed freely to the air, it will often not grow.

Dr. Truman W. Brophy:

What are your conclusions regarding the infection you are discussing?

Dr. Harms:

The general conclusions are these: It is a striking thing that in all cases of abscesses of the jaw this organism could be recovered. The next striking point is the fact that you can produce these lesions experimentally. A third striking point is the fact that when these lesions are removed the clinical systemic symptoms of the patient clear up in over one-half of the cases remarkably. Some of the cases to be sure are not benefited as we would expect, but yet a large number of them are, so that there seems to be, at least, a relationship between the streptococcus viridans, pyorrhea and systemic symptoms. Whether the pyorrhea is the primary invader makes no difference. It is found in all abscesses; it gets in there very soon, and whether the streptococcus viridans is able to become virulent enough to produce its own lesion is a question not yet settled. But this much is certain, that the drainage of these abscesses of the jaws and the auto-inoculation in the manipulation produce definite results clinically.

In one of the articles the question was raised as to whether it was not the mechanical irritation which causes the new formation of tissue so that the peridental tissue adheres to the tooth in one instance, while in other instances it does not. The question was raised whether emetin does not dissolve the substances which make it possible for the tissue to reunite to the tooth. All these are secondary questions.

The point I have brought out as to the specificity of the organism would have to be determined by some exact methods which has not yet been done, such as this being the complement fixation test in the first place, and the anaphylaxis test in the second place, to determine whether the organism which we isolate in any given case is producing a systemic effect, or, at least, producing an effect sufficient to cause the lesion such as we have.

Dr. Brophy:

A question occurs to me regarding the secretions from a dento-alveolar abscess or an abscess dependent upon the death of the dental pulp, and the pus which is secreted by the wall of a tooth root such as we find in these so-called cases of pyorrhea. There is a difference in the pathological and clinical aspects of the condition, one forms outside of the dental pulp, and the other is dependent upon the death of the dental pulp.

Now, what has been your observation regarding the character of the secretion at the end of the tooth root following death of the dental pulp and the pus that forms around the root in cases where the pulp is alive?

Dr. Harms:

You mean bacteriologically?

Dr. Brophy:

Yes.

Dr. Harms:

Hartzell has shown that the organism is the same. The organism he has been able to isolate is the streptococcus viridans. His first paper dealt more particularly with the pulp itself and abscess at the tip of the root and the second paper dealt more particularly with the peridental tissue, and in the second cases he was able to isolate in 150 cases the same organism.

Dr. Reid:

The difference, as I understand it, is one inside and the other outside.

Dr. Harms:

Yes. You make a division on histological grounds, but bacteriologically you cannot.

Dr. Brophy:

Do you regard the influence of calcareous deposits as an exciting cause of this condition?

Dr. Harms:

That is one thing I touched on a moment ago in speaking of emetin. In one of the articles Hoxie speaks of that fact and says that emetin probably serves to dissolve the calcareous deposits, and in that way assists in the removal of the pyorrheal condition.

Dr. Brophy:

And excites or brings about union of the pericementum with the cementum beyond the tooth.

Dr. Harms:

Yes, that is the idea.

Dr. Brophy:

Dentists pretty generally believe that infection about the necks of the teeth and pericementum is due to the accumulation about the teeth of salivary calculus, and that working its way up between the neck of the tooth and gum tissue, even as far as the pericementum and beyond, has been the exciting cause, the most potent factor, in bringing about this suppuration, and the suppuration is a sequel of that irritation, independent of any pathological factor at all, purely a mechanical cause. In that way the morbid condition has been brought about, just as a sliver would be stuck into your hand. In the description of the condition by Bass and Johns they do not go into any mechanical cause, any source of irritation, but simply go on to explain this pathological condition arising the same as it might in the kidney or any other organ of the body where infection occurs.

Dr. Harms:

In all of these articles there is no one who makes the statement or even suggests that the streptococcus viridans is the prime factor in starting the lesion, but it is the factor which burrows, goes deeper and which causes an extension of the severe condition you get.

Dr. C. N. Johnson:

If we have no irritation, I take it, the streptococcus viridans would not bring about that disease.

Dr. Harms:

It would not be likely to do so because its general virulence is low, but when it has a proper place to lodge and is living in the human body, under those conditions it gains in virulence and has the ability of destroying tissue before it, and in that way gaining entrance to the system with the resulting systemic conditions spoken of.

Dr. Brophy:

Every dentist knows that if he removes these deposits of salivary calculus which form upon the roots—if he takes them away thoroughly and makes the surface smooth, almost invariably the infection will take care of itself and the parts will get well.

Dr. Harms:

Yes, but that, of course, would be where the infection which is secondary, in speaking of it in that sense, has not gone beyond the limits you work on when you remove this calcareous deposit.

Dr. Reid:

There is another point that occurs to me, and it is this: It does not make any difference what the extent of the disease may be, if you remove the offending member or focus of infection, healing will take place immediately.

Dr. Harms:

I do not know from what I was able to gather from these articles whether that alone would always result in a cure.

Dr. Reid:

Invariably result in a cure about the teeth, particularly the immediate tissues in that neighborhood when the offending member is removed and the parts are restored to a normal healthy condition.

Dr. Harms:

Speaking from the medical or clinical side, that is not all sufficient, and in this connection I would like to cite a case I had about a week ago. A patient had recurrent attacks of rheumatism. These attacks were very severe, with elevation of temperature. Patient was treated in the usual way with salicylates and other agents. She had a condition which would be pronounced a mild pyorrhea. That was cleared up, and the teeth were pronounced in perfect shape and the gums in a perfectly healthy condition. She had subsequent attacks of very severe rheumatism.

Finally, x-ray plates were made and pus pockets were discovered lower down which did not show on the surface at that time. These pus pockets were opened up, thoroughly scraped, and that was some eight months ago and the patient since that time has not had a single attack of rheumatism.

DR. REID:

In other words, then, your germ has been embedded and it lives without oxygen.

DR. HARMS:

That is the point I made. It grows on the floor of the bouillon where the oxygen tension is much less than at the surface. If you cause the organism to be elevated to the surface or place it directly on a blood-agar plate, it does not grow until you bring it up gradually and it gets used to the oxygen and it takes on the characteristics of an oxygen consumer.

DR. ROACH:

By extracting the tooth or teeth, Dr. Reid said you cure the disease or pyorrhea.

DR. HARMS:

If you extract the tooth, you get down to the tooth roots and open up good drainage for any abscess that may be at the root.

DR. KESTER:

As I understand, if you remove or destroy the original focus of infection or initial growth, it will cure a disturbance in some other part of the body.

DR. HARMS:

Yes.

DR. KESTER:

In other words, it needs a perpetual spring of pus to keep up this disturbance.

DR. HARMS:

In the cases cited by Hoxie he speaks of one in which every seventeenth day there would be reinoculation with temperature. That shows that pus was being fed in periodically. In other words, it would seem to take that length of time for sufficient pus to accumulate to break its bounds and give a general systemic infection.

DR. KNOWLES:

I would like to ask a question. You spoke of deep infection which we refer to as blind abscess and of finding in these cases the streptococcus viridans, and you also found the streptococcus viridans in pockets which may or may not have been superinduced by mechanical irritation to start with. How do you account for infection in these blind abscesses unless the organism is taken up from the blood or is normally present in the mouth? Is it normally present in the teeth?

Dr. Harms:

No; it is not normally present in the blood. In healthy teeth you do not find it near the roots. You must keep in mind the general spread of organisms in the body. They spread by continuity; they spread, in the next place, through the lymphatic system which is the mode of removal to the nearest lymph gland where the phagocytic action destoys them. Then there is the blood stream, the little arterioles and veins. By any of these methods you may get extension.

Dr. Knowles:

They are carried in in that way.

Dr. Roach:

Hartzell brings that out clearly in his last article in a dental journal, of how bacteria get into a blind abscess. I think he makes it clear that it is rather a new explanation of how these blind abscesses really contain these special bacteria.

Dr. Knowles:

There must be an irritation there.

Dr. Davis:

How do you decide when it is necessary to use a vaccine and when it is not.

Dr. Harms:

Well, vaccine therapy is a very extensive subject to discuss, but all investigators believe that, whether it pertains to dental abscesses or bronchial asthma, the condition is the same. You have to remove the focus of infection from which there is constant absorption of toxins and infectious material. That is the first thing. If you are able to reduce that to a minimum, then a vaccine is good as an auxiliary, and with it work up to the highest point your bactericidal qualities, your antitoxic qualities, your agglutinative qualities and other antibodies which are thereby formed. In that way, while you are treating the case, you are producing an auto-vaccine, but should the condition persist, after you think you have cleared it up as well as you can, a vaccine will do the same thing as auto-inoculation. It will produce the highest power of immunization that you can get. The percentage of destroying power of the blood itself can be raised to a certain amount. If the invasion of the organisms is in excess of the percentage of the immunity you produce the disease continues, but if you are able to eliminate to a large extent the number of organisms that get in, increase more than the proportionate amount the bactericidal quality, then your vaccine will help.

DR. DAVIS:

The point I want to bring out is whether the vaccine will assist in the clearing up of the condition.

DR. HARMS:

Your vaccine, as I take it, will assist most when you cease to produce autoinoculation.

DR. DAVIS:

You would not use a vaccine while you are treating the case?

DR. HARMS:

No. The idea is this: every time you have autoinoculation you have a negative phase produced, a lowering of the resistance towards the organism, and then as your positive phase comes on you can give any treatment or use any vaccine you desire, either one of the two will do the same thing.

DR. DAVIS:

What about the interval?

DR. HARMS:

The shortest interval would be three days. Four days is about the average up to six days, and such advice is given not only by Hartzell but by Babcock, who writes on the subject of bronchial asthma. In bronchial asthma, according to Babcock, you find again, strange to say, the three organisms, the streptococcus viridans, the hemolytic streptococcus, and pneumococcus producing typical bronchial asthma, and in addition to that he has been able to isolate a fusiform anerobic bacillus. A combination vaccine in the treatment of bronchial asthma has given excellent results, but we know it does not cure the condition until you find the focus and get rid of it. One of the points that Dr. Babcock makes particularly in the treatment of bronchial asthma is first to find the tonsil that is diseased and remove it, or the sinuses of the nose or an abscess of the jaw, and after the focus of infection is removed the condition will markedly clear up. The focus of infection should be removed before you can finally end with a vaccine in getting rid of the bronchial asthma.

DR. DAVIS:

How often do you find this organism in Vincent's angina?

DR. HARMS:

Not very often. We do not believe that the anerobic fusiform bacillus we find in bronchial asthma is the same one as we find in Vincent's angina. It looks different. It is a different organism. It is not the same shape; it is smaller and absolutely anerobic.

DR. KNOWLES:

You lay more stress on the streptococcus viridans than on the streptococcus hemolyticus. I have understood that the streptococcus hemolyticus is the more virulent organism of the two.

DR. HARMS:

It is. The streptococcus viridans, as a normal inhabitant of the mouth, is comparatively harmless, but under proper conditions, or passing it through animals you can raise its virulence.

DR. KNOWLES:

In the mouth?

DR. HARMS:

If it gets into a pus pocket formed by a calcareous deposit about the teeth, if irritation is produced there where it can get proper products to thrive on, it can take on increased virulence.

DR. KNOWLES:

A mechanical pocket would be an ideal place for it to thrive in?

DR. HARMS:

Yes, that is the idea. It changes its characteristics. This must be kept in mind in connection with organisms. We find it not only in the streptococcus group but we are finding it in other groups, such as the gonococcus. The organism, when introduced into the body and harbored there for a while, changes its characteristics, and it is the same with the streptococcus viridans.

DR. KNOWLES:

The streptococcus hemolyticus is not as prevalent in the mouth?

DR. HARMS:

No. Hartzell has not been able to find any. Gilmer and Moody found them in a certain percentage of cases.

DR. BROPHY:

When a dentist has a patient suffering from this disease, after he has thoroughly removed the deposits from the teeth, in your opinion will that be sufficient to effect a cure?

DR. HARMS:

On general principles I should say yes, that would be sufficient, except it is difficult to know when you have removed all of the deposits as in the case cited. If you could take proper x-ray plates and be sure you cover the whole jaws you would probably do away with the further entrance of that organism, but the only trouble is this: The organisms that have already invaded may at the site of their ultimate journey's end produce a lesion which would serve as a focus of reinfection. Let us take endocarditis. In a way it is self-limited, but perhaps a couple of showers of thrombi would serve to start infection in other places; but in general terms I should say that would suffice except you are never sure when you have removed all the foci of infection.

DR. ROACH:

Do you consider the x-ray reliable in determining pus pockets?

DR. HARMS:

It seems to serve a useful purpose.

DR. ROACH:

But there are so many surfaces of the root that you cannot get an x-ray back of it, and my experience has been that as a diagnostic means it is not dependable at all. The x-ray is wholly unreliable as a diagnostic measure in determining pyorrheal pus pockets because of the angles and surfaces of roots of which you cannot get a picture at all.

DR. JOHNSON:

You may have a pus pocket reaching to the post-buccal surface and the x-ray would not show any evidence of it at all.

DR. ROACH:

The x-ray is susceptible of so many interpretations that we cannot wholly rely on it. It is only a secondary aid in the diagnosis of these conditions.

Dr. Harms:

Are there any other questions?

Dr. Roach:

In case we have removed all the deposits we possibly can, would there be any possibility of the eradication of the disease without the entire removal of the deposit or deposits?

Dr. Harms:

That is answered in the statement I made before. We take it for granted that in these pockets there are a certain number of organisms that get in from time to time. The system during treatment acquires certain resistance to the invasion. If your power of resistance is raised above the per cent. of the invasion, the condition would probably go on to a permanent cure; whereas if it were the reverse the probability is the pus pocket would become large enough so that the organisms gain entrance. The idea is that the streptococcus viridans starts out innocently, and the longer it persists in a place the more virulent it is likely to become, there is greater destruction, and the larger the pus pocket the severer the symptoms of generalized infection. That is a general statement, of course.

Dr. Johnson:

On that theory, you believe that our treatment of pyorrhea can be made more successful by thorough instrumentation than by any other means we have at our command?

Dr. Harms:

Yes. In addition to the instrumentation the only way of taking care of these pockets is to work up the immunization power of the system to the highest pitch, if possible above the point of infection. Active immunization you produce to some extent while you are treating the case, but after you stop treating it and you think you still have left some indication of infection, you have no means left except the use of vaccines, and it is wise, before you begin the treatment of pyorrhea to have a vaccine on hand, so that if you cannot eradicate the condition by thorough instrumentation, you have one good weapon left to keep up the immunizing power.

Dr. Brophy:

The question arises in my mind whether, if calcareous deposits are left upon a tooth root, with autogenous vaccines you can arrest the inflammation and suppuration that have been excited by their presence.

Dr. Harms:

That is a question of relative strength. Your immunizing power can be worked up to such a pitch. Vaccines themselves do only one thing and that is to increase the lytic or dissolving power, the agglutinative power, the precipitant power, and antitoxin power. In some way you must increase the flow of blood to the parts. How do you do that? One of the best ways is massage and instrumentation. That is another reason why instrumentation is a good thing. If the blood is surcharged with antibodies you must have some means of increasing the blood to the part. That is the theory of Bier's hyperemia.

Dr. Brophy:

When we consider deposits on the roots of teeth, they are classified as salivary and serumal; those that come from the saliva are known as salivary calculus, and the deposits which come from the blood direct are known as serumal calculus. It has been a question whether the serumal calculus which forms upon the cement of a tooth and beneath the pericementum is the exciting cause of inflammation or whether it is the product of an inflammation. I do not think anyone knows definitely yet. It has been studied a great deal. We get a dark brown deposit of calculus just as we get it on the bone. You have seen scores and hundreds of them following fractures, deposits of calculus about the region of the fracture which have been the result of the inflammatory process. Whether that deposit upon the cementum of a tooth is the result of inflammation which has been established there, or whether that is formed in some way and has been the exciting cause of the inflammation, has not been clearly settled.

Dr. Harms:

You have distinctly two different processes which might come into play. In one instance a limestone deposit is the end result of an inflammation, and in the other there is a neoplasm in the true sense of the word in which you have a deposit by cells whose function it is to deposit, and these cells are over active. In that case, of course, you would have a deposit of calcium salts, simply due to a tumor action that you get in a fibroma or in any sort of bone tumor; whereas in the other case you have definite signs of an inflammation. Of course, in those you have the earmarks of an inflammatory condition; you usually find some inflammatory cells present. Sometimes you have the small round cells, the eosinophiles, the mast cells, and a number of others, with an increase of connective tissue of an inflammatory character which is quite different from the connective tissue of a neoplasm. Histological work would serve to divide them distinctly into these two groups. The question at the bottom of it is, can a neoplasm, such as a fibroma, a carcinoma or sarcoma ultimately be produced by an infection. But we do not know.

DR. BROPHY:

We get a deposit of pus around a tooth resulting from the formation of a salivary calculus which works its way between the neck of the tooth and the gum. Again, as the result of inflammation of pericementum we get a deposit of serumal calculus that is in no way connected or associated with the external surface. It is up on the tooth above the line of union of the bone and the neck of the tooth in the alveolus, so to speak, and is in no way exposed to external influences from without. There is no way of reaching that except you perforate the tissues and scrape away the healthy tissues to get to it. There pus will form, having the same character of pus that you get in dento-alveolar abscess or a deposit around the neck of the tooth which comes direct from the external irritation, and it is that condition that bothers the dentist. It is a serumal calculus deposit in the so-called pericemental abscess that leads him into trouble, and that is where autogenous vaccines, it seems to me, will be of the greatest value in eliminating or raising the resistance to such an extent as to make further invasion of that inflammation impossible, or to retard it, at least. Whether it will arrest it or not is a question. It is a problem what to do with that kind of condition. If pus pockets form the dentist has the greatest difficulty in arresting the progress of the disease.

DR. HARMS:

If there is no autoinoculation, vaccines would be of value.

DR. DAVIS:

How often do you use the vaccines?

DR. HARMS:

That is again to be determined by two factors, the clinical results and the serological work, such as the opsonic index. Wright has shown that the average time is about four days.

Dr. Davis:

And then for how long do you continue the use of the vaccines and how many vaccinations?

Dr. Harms:

That again depends to a large extent upon the clinical symptoms, but the idea is this: The full effect of any vaccine treatment will usually not be seen before thirty days, and if you are not satisfied at the end of that time that your vaccines have produced the acme of power effect, you can continue longer than the thirty days, but thirty days is about the average time in which the system responds completely to any sort of inoculation.

Dr. Woolley:

What are the dangers attendant upon inoculation?

Dr. Harms:

They are similar to those that you produce with your instrumentation, with your autoinoculation; that is to say, every time you introduce a vaccine you use up within a short time all your available antibodies, producing a lowered phase of resistance which is your negative phase. If you drive the negative phase down too far you may have difficulty in regenerating the mechanism of the individual cells, these cells may be crippled, so that it is difficult for them to get back to the point where you started. You get a summation of negative phases and produce a crippling of the antibody formation of the individual cell. In other words, you kill it. You can even have individual cell necrosis if you go further. In two cases Hartzell spoke of there was a generalized streptococcic infection which resulted in death. The same thing holds true with reference to vaccines. I have myself given vaccines in such concentration for rheumatism that I actually produced a marked exacerbation of the condition in forty-eight hours. The case was convalescing nicely on increasing doses. I became over-enthusiastic and wanted to cut the time short. At the end of forty-eight hours that man had a terrific attack of rheumatism with swelling of the joints traceable directly to my vaccine.

Dr. Woolley:

Are there any conditions systemically that guide you in regard to what place you introduce the vaccine?

Dr. Harms:

You mean the site of injection of the vaccine?

Dr. Woolley:

Yes. Does it make any difference where you inject the vaccine?

Dr. Harms:

Not at all. The vaccine can be given in the arm. The vaccine itself is governed largely by the antibody content of the blood.

Dr. Woolley:

A paper was read at a previous meeting of this society by Dr. Schuhmann in which he pointed out certain dangers that arise from the use of vaccines. How are those dangers explainable?

Dr. Harms:

By the general condition I spoke of as being the production of a negative phase and crippling the antibody formation. There is this much to be said about vaccines: You can give them of different types. You can give vaccines of a virulent organism which contains a large amount of toxic substance. On the other hand, you can autolyze them and remove a part of the toxin, and give much larger doses of the second type than of the first. If you remove the poisonous portion you can give the less poisonous portion in larger quantity. It depends very largely upon what you are trying to do with your vaccine. If you are trying to form antitoxin in the blood, something that will withstand the poisonous portion of your infection, then you give the toxic part; but if you want to produce the lytic or dissolving power you give the non-toxic portion. As I say, it depends upon what you are driving at.

Dr. Roach:

A patient, for instance, was operated on for sinus trouble. Practically all the accessory sinuses were opened, but seven or eight months after the operation was performed there was still the presence of a green purulent discharge. In a case of that kind would you consider that a vaccine would be indicated, or is there a possibility of benefit to that patient from the use of vaccines?

Dr. Harms:

Yes, the point is this: In an infection of that kind, where you have the condition practically walled off from the general system, the amount of autoinoculation is not sufficient to work up the antibodies to the highest pitch. There a vaccine would be of benefit.

Whether a vaccine would be all sufficient is another question; but you can make a vaccine, and if it does the full work you have an ideal result from it.

DR. ROACH:

These sinuses were involved and operated on through the nose, and yet there is this green purulent discharge.

DR. HARMS:

The thing about vaccines is this: You can never tell beforehand how much good they are going to do. The proof of the pudding is in the eating; that is to say, you get some very striking results from the use of vaccines. We get letters almost every week telling of the striking results obtained in certain cases, and yet in almost identical cases where the same treatment is given there is no response. As general principles, we know it is necessary to drain the focus properly. In the second place, the immunizing power must be driven as high as possible. That can be done with a vaccine, and a third point is to let the blood which is surcharged with antibodies get in intimate contact with the infection.

DR. WARREN:

I do not think I have anything in particular to say on this subject because Dr. Harms has told you more than I know about vaccines. However, I have been very much pleased in coming here to meet you. I shall be glad to have all of you come over to the National Pathological Laboratory, Mallers Building, and see how we make these vaccines. I believe that we make vaccines better than anywhere else in the country. We have a place where the doctors can come and get the proper vaccines. Of course, in some of the research places and in some of the good hospitals, like St. Luke's, the Presbyterian, and the Michael Reese, you can get good vaccines, but for the general practitioner engaged in both dentistry and medicine, it is hard for them sometimes to know where they can have good vaccines made, and therefore I would like to have you come over and visit our laboratory and see what kind of work we do. We will show you a real, up-to-date place; and all our workers are in the same class as Dr. Harms, and we consider ourselves strictly modern in everything we do.

I wish to thank you for the honor you have given me in attending this meeting.

DR. TRUMAN W. BROPHY:

We appreciate very much what Dr. Harms has done for us this evening. His contribution has been a very valuable one to the work of this society. It would be a great treat to us if Dr. Harms could attend our meetings occasionally and give us some of his valuable time in discussing these kindred subjects. But the one he has discussed tonight has been of the greatest importance to us because we know that the subject of infections of the mouth is now attracting perhaps as much, if not more, attention on the part of the medical profession than any other subject. I am sorry to say that many of the men who are attempting to deal with this subject have acted upon a very limited knowledge of it. Instead of entering deeply into the study of the subject and getting information from Dr. Harms and his associates and others who have studied it thoroughly, and who have reached a rational conclusion as to diseases which emanate from the teeth, or which are due to oral infections, they have jumped at conclusions and in many instances interpreted X-ray plates erroneously. They have acted upon their own judgment, which was oftentimes defective, instead of getting information or opinions from men who are thoroughly acquainted with dental pathology.

I have found within the last two or three years that in my early experience I made many mistakes in reaching conclusions based upon what I then understood from reading Roentgen photographs of pathological conditions. To-day many of the conditions which I formerly believed were pathological, I am satisfied are not.

I have a skiagraph showing a condition which was strikingly pathological about a molar and a bicuspid tooth, the pulps of which had been devitalized and the roots filled. One of the roots was filled badly. A physician ordered these teeth removed. He sent a direct order to a dentist to take them out, but the dentist sent the patient to me. I had some more X-ray pictures taken. I here exhibit one. While the two teeth were pulpless the patient suffered from intense neuralgia extending over a period of four months. As I have said, these molar teeth were ordered to be taken out. The bone about them was found to be normal. There was no infection, yet they were pulpless teeth. Instead of recognizing the actual condition which existed, which was a deposit of secondary dentine, or so-called pulp nodules, which was the exciting cause of the neuralgia in another tooth, this eminent physician ordered the extraction of the teeth around which there was no disease. What was necessary in such a case was to remove the cause of the irritation, which was the pulp nodule in the second molar tooth. When the dentist opened into the tooth and removed the pulp nodule, which could be easily seen in the skiagraph, the pain disappeared as if by magic. The neuralgia was cured and it has not returned.

Such are the errors that are being made by men who think they know, but who do not know dental pathology. They are not authorities on dental pathology because they have never had an opportunity to study it. I think Dr. Harms and other medical men agree with me when I say that the medical colleges must revise their curriculum, and they must teach their students these things that Dr. Harms has told us about this evening. We know that medical students go out into practice with no knowledge of dental pathology except a little they pick up here and there. They have no teachers in the medical schools, with few exceptions, who are competent to teach diseases of the teeth, and inasmuch as they do not prepare students for this work, what happens? When they are brought in contact with cases of neuralgia and many other maladies which have their direct origin in the mouth, they are unable to treat patients skillfully and scientifically.

I feel that the dental schools should be quite as progressive as the medical schools in this regard.

In this great field of medicine, in this great improvement in medical education in the lengthening of the course to five years, do you not think it would be a pretty good plan to teach these men something about the most prevalent disease known to the human family—disease of the teeth? Ninety-seven per cent. of the people are affected with them, and yet the medical students learn practically nothing regarding them. Is it not time for substantial reform in teaching them the abnormalities they have to contend with as they go out into practice and meet their patients? I think so. I know this from experience, having been engaged in teaching medical students for twenty-five years. I know how anxious they are to learn but the medical colleges, with rare exceptions, do not give them any information on this subject at all, and that is something which should be brought before medical societies and medical faculties and discussed until the time comes when they can bring the medical standard up to where it should be and medical students are trained how to meet their patients, how to make a correct diagnosis, and treat diseases intelligently instead of jumping at conclusions and administering remedies without knowing the nature of the disease with which the patient is affected. I would like to see such changes brought about.

A young graduate, who has not been out more than two years, an intern in one of our great hospitals, told me a few days ago that he never heard a lecture on dental pathology in his life. He spent four years in a medical college. His medical professors could not intelligently treat these patients without knowing how to make a diagnosis, and it is unnecessary to say that they could not reach what they do not know. They have never learned what to do, with some few exceptions. You all know that is true, and I hope you will do all you can in the work you are engaged in, Dr. Harms, before medical men and medical faculties, to impress upon them their duty in this matter and give the boys a chance. (Applause.)

Dr. L. L. Davis:

I have visited the laboratory of Dr. Warren and Dr. Harms several times, and I know the excellent equipment they have there, and I know from what has been said this evening, and from talks I have had with both of these men that they are in a position to help the dentists in these difficult cases they have to contend with.

I think if we knew a little more about vaccines and when to administer them, we could in many instances render greater benefit to our patients. The idea has been suggested that where we have a case that looks to be a bad one, it would be well to have a vaccine on hand, whether we use it or not if the patient does not respond to proper and thorough instrumentation.

I have not given very much thought to the use of vaccines; I have expressed myself as being opposed to the injection of drugs of any kind unless this was absolutely necessary, as I believe that surgical intervention and proper cleansing of the surfaces are all that is necessary. But we must acknowledge that we do have cases, even after we have done our best, that do not clear up, and if we will bear in mind that we have such an institution near at hand, where we can take a patient to the laboratory for the making of a vaccine, or get the opinion of these men for it, I believe we will be able to accomplish more good than we have done in the past in certain cases.

Dr. J. E. Hinkins:

I have enjoyed Dr. Harms' talk very much, and I heartily endorse everything he has said. My only weakness is that I cannot accomplish the work that he does because I have to practice dentistry for a living. However, at odd times, when not engaged in practice, I have spent more time in the chemical laboratory than I have in the bacteriological laboratory, and when my friend Dr. George W. Cook, was alive we spent many hours together, I working with the test tube, and he with the microscope. The streptococcus viridans is an old acquaintance; I have been working with it off and on for twenty years. As we look at the different colors I do not know whether it is right or not to speak of the power of transmutation, but it reminds me of the many hours I have spent in working over these things. I never could quite warm up to bacteriology and the use of the microscope as much as I could to chemistry. My imaginative bump is hardly large enough to make a good bacteriologist. Dr. Cook could find the microorganisms and show them to me, and I could get results with the test tube that he could not get. Nevertheless, I appreciate the word that Dr. Harms is doing and has done, and I do sincerely hope that not only the medical schools of the country, but the dental schools as well, will do better work along this line. There are a lot of things that medical and dental students need to know.

Fortunately, I have been associated in my office with one or two physicians, and we co-operate with one another, and there is hardly a day that we do not have some case in common between us, and this co-operation has been a great help to me. I have many cases to deal with that need the assistance of a physician, particularly as regards constitutional treatment in cases of pyorrhea and abscesses. While I do not wish to be considered conceited, I think probably I have been of as much assistance to them as they have to me.

I like meetings of this kind, and I wish we had more time so as to see more slides, showing the characteristics and peculiarities of each germ, its habitat, association, etc. It is a wonderful field.

Dr. Sydney J. Knowles:

In the first place, I would like to express my thanks personally to the essayist for his very instructive and edifying remarks.

One particular point that has been brought out tonight and emphasized, and with which I agree, is that in the treatment of certain conditions, particularly those of pyorrhea, the mechanical factor is one of the greatest to be considered, and after this talk by Dr. Harms tonight we know that we can go a step further and in certain cases carry on a part of our treatment by using an autogenous vaccine.

Another point has occurred to me after listening to Dr. Harms' remarks, namely, that in the practice of dentistry we ought to make cultures more frequently than we do as a means of knowing more definitely what we are doing. In the past we have simply looked at the clinical picture. We have discussed the question of the X-ray picture, and are agreed that it is very essential as an aid in making a diagnosis in certain cases. Now, if we take the clinical picture, the X-ray picture, and consider them along with the bacteriological condition of the mouth, I feel that we are much better equipped and able to treat the conditions that confront us, instead of relying on simply one or two of these aids to treat our cases.

Dr. Harms (closing):

The only point I want to bring out is the fact that while the streptococcus viridans is comparatively easy to grow, simply because you get streptococcus from a pus pocket in the mouth, does not necessarily mean that the streptococcus you have isolated is the exciting organism.

I want to point out that the next step we are coming to is to prove the fact that this organism is producing an effect on the individual cells in the body, as evidenced by reactions in the blood, the complement fixation test, the anaphylaxis test of the skin. That is coming. That is new yet. It is not standardized.

One word in reply to what Dr. Hinkins has said about chemistry. Many of our blood tests are coming to be, instead of complement fixation tests, analytical chemical tests. The time is coming when, instead of doing Wassermanns, we will determine the substances which can be obtained chemically and measure them quantitatively, in addition to proving its presence.

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EDITORIAL.

THE RESEARCH FUND

As the time approaches for the meeting of the National Dental Association it is well to have particularly in mind the significance of the present status of the Research Fund. During the past year, under the direction of Dr. Weston A. Price, the chairman of the Research Committee, wonderful progress has been made. A building has been dedicated to purposes of research in the city of Cleveland, and substantial additions have been made to the building fund and the research fund.

In a recent letter from Dr. Price he makes the following interesting statement: "There has been provided in pledges or cash $27,350 of the $50,000 required, a little over fifty-four per cent, for the building, and the total of all five year pledges and donations is a little over $69,000, which would give us an income, if all could be realized without expense for collection, of $13,800. The further perfection of the organization and the securing of headquarters and an equity in real property has very greatly stimulated the interest and confidence in the work, for there has been about three times as great an increase in the equities of the Research Department in seven months, since purchasing the building, as in the fifteen months preceding that time. Unfortunately, it is costing about ten per cent to make collections, besides which many men are careless and are very far behind in their payments. It is exceedingly important that our income be more ample and dependable and, if possible, the burden of providing it more equitably distributed. Six states have already voted to adopt the new basis, to increase the dues one dollar for the support of the research work, in addition to the increase for the JOURNAL. We are confident the entire membership of the National will adopt this plan, which will give approximately $18,000 a year for research work, which is the interest at five per cent on an endowment of $360,000. The trustees of the institute are undertaking to raise a mililon dollar endowment, and they are confident, with the support of the profession, that this will be accomplished."

The chief thing of significance is the spirit which is spreading in the profession, chiefly through the noble self-sacrifice of Dr. Price. This spirit manifests itself in an awakening wherever he goes to the vast possibilities of research work carried on under the initiation and support of the profession. There is developing a pride among the members in the fact that a profession as comparatively young as dentistry and containing so few in numbers can organize and finance research work on the scale that this has already assumed. Then there is the earnestness and devotion of those who are actively engaged in the research work itself under the direction of Dr. Price, and the results that are being brought about. One of the chief difficulties in this movement is to develop men who are qualified by nature, inclination and opportunity to do real scientific work, and next to Dr. Price himself the greatest credit for the progress already made must go to the men in different parts of the country who are devoting themselves unselfishly to the actual work of investigation.

All this is having a wider effect than the rank and file of the profession suspect. At the beginning of the movement the greatest barrier to success apparent to the profession as a whole was undoubtedly the question of finance. This matter loomed up in the minds of most men as the really significant problem to solve. And at the beginning it was no small item. But as the profession responded so readily to the appeal for funds, and particularly as the spirit previously alluded to began to develop it opened up new possibilities, and now let it be whispered that the only thing lacking for an adequate fund to come from outside the profession in support of this movement is a sufficiently enthusiastic endorsement, and a demonstration of the fact that the profession is fully prepared to carry on the work in a thoroughly efficient manner.

The eyes of the world are upon dentistry as they never were before. This is manifest in the present war; in the growing significance of general disorders coming from dental origin; in the awakening to the importance of oral hygiene in our public schools and other institutions, and in various ways which will tend to put us upon our mettle, but in no one respect are we to be weighed in the balance more keenly than in our attitude toward this matter of research.

Let us to a man rally around the Research Committee in a way to prove our loyalty to our profession, and our consecration to the best interests of a common humanity. If we do this now we will lay the foundation for a more wonderful advance in dentistry than has ever occurred in the history of the world.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

Handy Sprues:—Your old Victrola needles make good sprues and in many cases can be attached to the wax in the mouth.—*J. F. Nelson, Chicago, Ill.*

A Handy Varnish Container:—The regular synthetic liquid bottle is an excellent container for De Trey's neutral varnish, the cap doing away with the sticky cork of the ordinary bottle. I occasionally find the small dropper very helpful in applying the varnish.—*E. S. Guthrie, Chicago, Ill.*

To Freshen Gold for Casting:—Never use the same gold for casting more than once without cleaning. This can readily be done by making a metal casing for a carbon block to overcome block cracking under heat. Place gold in carbon block and while in molten condition add a mixture of one part of borax to three parts of potassium nitrate. This kept up for a few minutes will render gold in splendid condition for casting and good results can be expected.—*W. D. N. Moore, Chicago.*

To Roughen a Broach:—Fold a carborundum paper disk—medium grit—across center and pinch together while drawing broach between folds. If desired to withdraw cotton from canal with broach rotate it backward and forward while drawing through disk. If cotton is to be left in canal with dressing draw through disk without rotation; a slight backward turn will free broach and leave treatment. Examine prepared broach with magnifying glass and reason will be apparent.—*J. T. Search, Onarga, Ill.*

Cellutone for Repair of Plaster Models:—Cellutone is a clear, viscid liquid made by dissolving approximately one gramme of celluloid in ten cubic centimeters of acetone. With this solution a broken plaster cast may be repaired so perfectly that it is difficult to detect, and when permitted to thoroughly dry out the plaster will break in any other part easier than it will in the repaired fracture. The clean, clear celluloid strips that are no longer useful for condensing silicate fillings are valuable for this purpose.—*D. N. Lewis, Lake Forest, Ill.*

To Refit an Upper Vulcanite Plate:—Take impression and model same as for any plate. With mechanical saw cut out all the palatal portion of old plate to within a quarter of an inch of the pins. Scarify the palatal part of what is left and thoroughly clean with chloroform. Now mix Dougherty's Vulcanizable Gutta Percha with chloroform to the consistency of soft putty and spread over the portion of the plate that goes over ridge and press to place on the model. Also paint the model with this paste but made thin. Fill the palatal portion with the sheet vulcanizable gutta percha, flask and vulcanize.—*E. T. Evans, Decatur, Ill.*

The Magnifying Glass:—Have a good one handy, one large enough that you don't need a magnifying glass to see it, about two inches in diameter, use it for cavity inspection after preparation and be surprised at the many defects left; use it after amalgam is packed into cavity and carved to contour and see how imperfect you have left some places; then you will not wonder why some fillings fail; use it for looking up into anterior root canals while removing old root fillings; use it especially for intensifying silver nitrate cauterization, letting the direct rays of the sun shine through the glass and see how quickly the surface of tooth is burned a deep black.—*W. O. Fellman, Oak Park, Ill.*

Clasps:—For a partial lower rubber denture the best in all respects is the double loop wire clasp, using 18k. 18 gauge gold wire, about one and a half inches. With flat nosed pliers bend double, leaving one-sixteenth inch space between. Fit with pliers the loop to the buccal side of plaster tooth. It is not necessary that it touch every bit of the surface. As the rubber forms the lingual surface of the clasp, the ends of the wire are turned at right angles to be vulcanized into the rubber. After arranging the teeth and waxing up, leaving sufficient room for the clasp, take it in the pliers warm and drop into place. This clasp is quickly made, easily adjusted and cleaner than the band clasp.—*L. P. Haskell, Chicago, Ill.*

Soldering in Dry Investment:—In repairing bridges or crowns where we have gold or gold and porcelain combination, and where the parts are held together by their own continuity, invest in coarse fibre asbestos, leaving exposed only part to be soldered. If soldering is to be done on side where porcelain is, have porcelain on upper side and cover it with asbestos and with the blow pipe flame heat this porcelain first, then proceed with the heating of the part to be soldered. If the soldering is on the opposite side from the porcelain, then put the porcelain downward on asbestos and with the Bunsen flame heat the porcelain before soldering is begun on the opposite side. This method will save considerable time over investing with the ordinary wet investment.—*C. E. Allshouse, Chicago, Ill.*

Direct Use of Plaster for Cusp Formation:—After constructing and adjusting the band for a shell crown frequently we are confronted with the problem of completing the crown at the same sitting, for the convenience of the patient. Many dentists solve this problem by the use of the various die plate systems on the present day market. The results obtained from such methods do not merit consideration, because they are little if any more accurate than an ordinary assortment of ready made crowns.

Another method frequently employed is to fill the occlusal end of the band with one of the various carving compounds. The patient is instructed to close the jaws, thus obtaining the occlusion. Then the band with the compound is removed, the cusps carved, and the die or counter-die obtained therefrom. The results obtained from this method are crude and inartistic, because the tendency of carving compounds to flake in carving and to change their form in the subsequent process of securing a die or counter-die for swaging.

Plaster, of course, is the only reliable material for cusp formation, but the objection frequently made is the routine of model construction. Now, plaster can be used directly in the mouth for cusp formation, thus eliminating the necessity for making models. The plaster must, however, be mixed to a slightly thicker consistency than usual, with the addition of a hastening agent, preferably sodium chlorid. Fill the occlusal end of the band and instruct the patient to close the jaws, allowing the plaster to set. Remove the band and plaster, pass through a flame to drive off excessive moisture and to gain additional hardness. The cusps and planes can then be carved, the sulci and fine lines reproduced, and the swaging done with a Coates swager. In this manner artistic results can be obtained that are limited only to the proportionate degree of skill manifested by the operator.—*L. J. Huber, Ste. Genevieve, Mo.*

CORRESPONDENCE

Hartford, Conn., June 12, 1916.

Dr. C. N. Johnson.
Editor DENTAL REVIEW:
My Dear Doctor:

In 1865, Chicago set the pace for dental gatherings. The annual meeting of the American Dental Association held four days' sessions in the Crosby Opera House building and Drs. N. B. Davis, Profs. Brainard, De Laskie Miller and Dr. Hildreth and other well known medical men took an active part in helping to make the four days' meeting *appear* to be a cordial recognition of dentistry as a specialty of medicine and surgery. Public dental clinics were given for the first time at these sessions. Since that memorable occasion, societies, colleges, universities, text books, literature, magnificent dental infirmaries, the gifts from Messrs. Forsyth and Eastman, have startled the professions and the public of the civilized world. Monster gatherings all over the country, two notable ones of several thousand each held in Chicago, and during all these past years the Journal of the American Medical Association, published in Chicago, has not found space in its columns for the date of the annual meeting of the National Dental Association.

Do you mind telling the public why dentistry is ignored?

Yours truly,

JAMES McMANUS, D. D. S.

MEMORANDA

FINAL NOTICE.

The meeting of the National Association of Dental Faculties will be held at the Seelbach Hotel, Louisville, Ky., July 22nd and 24th. Executive session at nine o'clock Saturday, and general session at ten o'clock. Charles Channing Allen, Secretary, Tenth and Troost, Kansas City, Mo.

THE LOUISIANA STATE DENTAL SOCIETY.

At the thirty-eighth annual meeting of the Louisiana State Dental Society, held in Lake Charles, the following officers were elected for the ensuing year: Paul N. Cyr, president; A. K. Fort, first vice president; C. S. Tuller, second vice president; J. Crimen Zeidler, secretary; J. A. Gorman, corresponding secretary; O. J. Ory, treasurer.

New Orleans was selected as the next meeting place, and in view of the fact that a meeting is being planned comprising the dental societies of Alabama, Louisiana, Mississippi and Texas, this gives promise of being one of the largest meetings ever held in this part of the country in quite a number of years. A program of unequalled excellence is being prepared and efforts are being directed towards bringing to New Orleans some of the leading men in the profession.—J. Crimen Zeidler, Secretary.

THE SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

The nineteenth annual meeting of the Southern California Dental Association will be held at the College of Dentistry, U. S. C., Los Angeles, on July 20th, 21st and 22nd.

The association is exceedingly fortunate this year in having secured as the principal essayist, Dr. Edward C. Kirk, Dean of the Thos. W. Evans Institute School of Dentistry of the University of Pennsylvania, and editor of the *Dental Cosmos*. Among other well known men who will contribute to the program are Dr. Cummer of McGill University, and Dr. Fred E. Hart of San Francisco.

The first two days of the meeting will be devoted to essays and clinics, while the third day will be spent on the annual outing, which upon this occasion will be a trip to the Panama-California Exposition at San Diego.—W. E. Sibley, Secretary.

THE ALASKA DENTAL ASSOCIATION.

This organization was founded in 1914, and is in many respects a unique association. An extract from the constitution says:

"The purpose of this organization shall be: The promotion of efficient, scientific and honest dentistry; the strengthening of fraternal bonds as between dentists; confidence as between them and the laity; and the spreading of the teachings of oral hygiene."

In addition to the dental membership they have an Associate membership among the medical profession, with a membership fee of $5.00 and no annual dues for associate members. This brings them into close touch and sympathy with the medical men, and promotes a community of interest. This association seems to be a very live and up-to-date organization, and we send our best wishes for the greatest measure of success. The President is Dr. Charles Daggett, of Seward, and the Secretary-Treasurer, Dr. R. C. Mathis, Juneau.

DINNER TO DR. CHARLES S. BUTLER

On May 27, 1916, the Eighth District Dental Society and the Buffalo Dental Association joined in a complimentary dinner in honor of Dr. C. S. Butler, one of the wheel horses of the profession in Buffalo. The dinner was a success in every way, about one hundred being in attendance, and it was a fitting tribute to one of the most lovable and honored men in the dental profession. We are informed that Dr. Butler will retire from practice to devote his time toward work for the endowment of ministerial relief and sustentation of the Presbyterian church in the United States. He is the only layman named as field secretary. It is a wrench to our sentiment to spare him from dentistry, but we most cordially wish him great success and happiness in his new field of effort.

XI PSI PHI FRATERNITY.

The annual meeting of the National Alumni Association of the Xi Psi Phi Fraternity will be held at the Watterson Hotel, Louisville, Ky., Monday, July 24, 1916. Important matters will be presented and all members of the fraternity are requested to plan their arrival in Louisville to attend the meeting and the banquet the same evening. The Xi Psi Phi headquarters will be at the Watterson, and reservations should be made in advance.—Clarence O. Simpson, President; Charles D. Gilman, Secretary.

OFFICIAL PROGRAM OF THE TWENTIETH ANNUAL SESSION OF THE NATIONAL DENTAL ASSOCIATION.

"Silicate Cements," Dr. C. Clyde Davis.
"Taking Impression in Modeling Compound and Anatomical Setting Up of Teeth," Dr. James P. Ruyl.
"Prevention of Permanent Malocclusion," Dr. L. Lowe Young.
"System in State Society Work," Dr. A. M. Flood.
"The Postgraduate Type of Dental Meeting," Dr. C. R. Lawrence.
"Essentials for Success of the Progressive Clinic Plan," Dr. Weston A. Price.
"The Relation of Mouth Infections to Systemic Infections," Dr. Thomas B. Hartzell.
"Root Canal Fillings," Dr. John R. Callahan.
"Studies for the Identification and Differentiation of Pathogenic Organisms of Mouth Infections;" "Ionic Medication Studies," Dr. Weston A. Price.
"Peridental Membrane," Dr. Frederick B. Noyes.
"The Relation of the Glands of Internal Secretion to Dental Problems," Dr. Wm. J. Gies.
"Salivary Analysis and Dental Caries," Dr. Russell W. Bunting.
"Salivary Deposits," Dr. Percy R. Howe.
"Oral Hygiene in Its Relation to Public and Individual Health," Dr. Otto U. King.

"The Eastman Dental Dispensary," Dr. Harvey J. Burkhart.
"Surgical Treatment of Pyorrhea," Dr. Carl D. Lucas.
"Prophylaxis for Pyorrhea Patients," Dr. Paul R. Stillman.
"Prophylaxis for Children," Dr. Gillette Hayden.
"The Evolution of the Principles of Regulating Appliances," Dr. Martin Dewey.
"Some Phases of Early Orthodontic Treatments and Developments," Dr. Frank M. Casto.
"Application of Amalgam in Modern Dentistry," Dr. John V. Conzett.
"Crown and Bridge Work," Dr. Forrest H. Orten.
"Chemistry and Metallurgy," Dr. J. P. Buckley.
"Anesthesia in the Curriculum, Clinic and Private Practice," Dr. Hugh W. McMillan.
"Oral Surgery under Nitrous Oxid-Oxygen Anesthesia in the Forward-Inclined Sitting Posture," Dr. Ira O. Denman.
"Vapor Anesthesia for Oral Surgery," Dr. Truman W. Brophy.
"Intro-Oral Methods of Local Anesthesia," Dr. Rich. H. Riethmuller.
"Extra Oral Methods of Local Anesthesia," Dr. Kurt H. Thoma.
"Handling Emergencies under Anesthesia and Analgesia," Dr. N. T. Yager.
"Dental Cements," Dr. Marcus L. Ward.
"Brown Stain Problem," Dr. Frederick S. McKay.
"Metallurgical Researches," Dr. Frank A. Fahrenwald.
"Dental Education," Dr. H. L. Banzhaf.
"Education of the Public on Oral Hygiene, Through the Dental Society," Dr. Thaddeus Hyatt.
"Efficiency in State Society Work Depends on Publication of a Monthly Journal of the National Dental Association," Dr. Otto U. King.
"State Societies Organized for Legislative Purposes," Dr. Homer C. Brown.
Sectional Progressive Clinic.

NEW LEGISLATION AFFECTING THE ARMY DENTAL CORPS.

The Conference Committee's report upon the Army Reorganization Bill was agreed to by the Senate May 17th, by the House May 20th, and approved by the President June 3rd. Incorporated in this bill is the following provision relating to the Army Dental Corps:

"The President is hereby authorized to appoint and commission, by and with the advice and consent of the Senate, dental surgeons, who are citizens of the United States between the ages of twenty-one and twenty-seven years, at the rate of one for each one thousand enlisted men of the line of the army. Dental surgeons shall have the rank, pay, and allowances of first lieutenants until they have completed eight years' service. Dental surgeons of more than eight but less than twenty-four years' service shall, subject to such examination as the President may prescribe, have the rank, pay and allowances of captains. Dental surgeons of more than twenty-four years' service shall, subject to such examination as the President may prescribe, have the rank, pay, and allowances of major: Provided, That the total number of dental surgeons with rank, pay, and allowances of major shall not at any time exceed fifteen: And provided further, That all laws relating to the examination of officers of the Medical Corps for promotion shall be applicable to dental surgeons."

It will be noted that this does not contain all the recommendations submitted by the Legislative Committee of the National Dental Association and strongly championed by them, as well as the many loyal supporters from all sections of the United States. However, it should be recognized that all legislation, especially when it becomes necessary for a Conference Committee to harmonize the conflicting provisions passed by the two branches of Congress, is more or less of a question of compromises, and best results can only be expected when a sufficient number of the Conference members are friendly to the interests involved. Therefore, we feel that those who have been in close touch with all these circumstances will fully appreciate the situation and accept what has been secured as a very decided improvement over present conditions.

In this connection, and as a comparison, the following may be interesting: In 1901 Congress passed an act establishing an Army Dental Corps, the members of which served as Contract Dental Surgeons until 1911, when, under specific conditions, the rank of First Lieutenant was granted by Congress. At the present time there are seventy-five members in this corps, thirty-six first lieutenants and thirty-nine acting dental surgeons. Thus, it will be noted that two additional grades, with actual rank, have been added, and when this new legislation becomes operative, up to its full quota, there will be approximately two hundred members of the corps, which is on a basis of "one to each one thousand enlisted men in the line of the army." Actual rank has been intentionally emphasized since there was a strong and persistent effort upon the part of a majority of the Senate Military Affairs Committee, to deprive the members of the corps of the rank of first lieutenant. This attempted injustice was corrected by the Senate adopting the first and most important provision of Senator Pomerene's amendment, that is, actual rank.

In view of these changed conditions the future of this service will be decidedly more attractive and should not only strongly appeal to the dental graduates of today, but this should also stimulate the members of the corps to develop it to its highest possible efficiency.

For the benefit of those not familiar with the procedure in securing this legislation it may be very properly stated that this has not been accomplished without a vigorous fight and many sacrifices upon the part of a goodly number of persons. Strong opposition, as well as some positive support, developed from sources least expected, and in due time, we expect, as a matter of justice, to make a public acknowledgment to those who loyally co-operated in behalf of this legislation and made possible that which has been assured. Respectfully submitted, Homer C. Brown, Chairman Legislative Committee, N. D. A., 609 Hartman Building, Columbus, Ohio, June 6th, 1916.

COLLEGE COMMENCEMENTS

LINCOLN DENTAL COLLEGE.

Graduates: R. E. Anderson, J. P. Barry, R. J. Brigham, L. A. Clopine, V. Coulter, Y. W. Dorwart, E. E. Duntz, J. V. Farrington, E. R. Gardner, S. D. Greene, C. S. Greusel, R. F. Kouba, E. F. Klein, C. C. Lillibridge, H. B. Linch, J. B. Marshall, Harold Neville, H. L. Sharp, D. K. Stuart, G. L. Spencer, R. E. Sturdevant, W. S. Spanton, Arnold O. Specht, W. B. Seace, C. D. Totman.

KANSAS CITY DENTAL COLLEGE.

Graduates: J. R. Anderson, O. R. Anderson, E. E. Bailey, J. W. Baldwin, V. E. Barnes, C. F. Barr, L. W. Berkeley, H. L. Blachly, Edward Block, Anthony Browning, J. R. Burgess, R. H. Cheney, W. L. Crawford, P. F. Cutshaw, V. E. Dandey, Juel Denebeim, E. L. Dillon, I. G. Doane, H. L. Douglas, J. D. Dyer, F. J. Faulkner, E. D. Goheen, F. G. Hagenbuch, M. H. Holmes, E. C. Houser, W. R. Humphrey, W. W. Hunt, E. E. Jordan, R. E. Keith, M. A. Kenney, C. W. Kolosick, A. B. Martin, L. A. Mehler, J. E. Mehlhaff, F. B. Misse, W. C. McClelland, W. H. McDonald, Edwin Clay Osborn, F. H. Prosser, W. C. Reed, F. R. Reid, R. A. Smith, J. A. Steele, L. W. Stewart, R. E. Stewart, R. A. Stratton, E. R. Swain, C. R. Swander, J. T. Shadburne, E. H. Van Meter, M. M. Voshell, C. L. Walker, H. W. Wharton.

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OUR PRESENT CEMENTS WITH SPECIAL REFERENCE TO THOSE CONTAINING COPPER.*†

BY MARCUS L. WARD, D. D. SC., ANN ARBOR, MICH.

There are probably few in the dental profession who have not had pointed out that copper or copper salts possessed a more or less toxic action upon lower forms of organisms. This is particularly true since the manufacturers of dental cements began to introduce the various salts of copper in varying percentages from 2% to 97% into their cements. Some of you, however, undoubtedly have in mind the days when amalgams contained large percentages of copper and are familiar with the observations made then in regard to inhibition of the progress of caries and generally favorable action of such amalgams upon the soft tissues with which they came in contact.

Others of you have probably followed the work of some of our bacteriologists the results of which point quite generally towards the theory that copper salts are antiseptic. Certainly none of you have been so obscured from dental literature, or so indifferent to this phase of it that you have not heard the claims of the manufacturers of our present copper cements relative to their germicidal qualities. While the first copper cement in anything like the present form of these products was probably introduced by Ames about twenty years ago there appears to have been no particular attempt to convince the profession that copper salts generally possessed germicidal action until the makers of dental cements began to market products with different copper salts in them and in a variety of percentages.

Since several manufacturers have entered the field, however, the situation has changed and it has become necessary for first one and then the other of these manufacturers to defend themselves against attacks by competitors, as a rule, and the result has been claims of germicidal action for at least four different salts of copper, cupric oxid, CuO black in color, Cuprous oxid $Cu2O$ red in color, cuprous iodid $Cu212$ light in color, cupric phosphate $CuHPO4$ and cupric silicate $CuSIO3$ both light in color.

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*Read before the Chicago Dental Society, May 16, 1916.

†The writer acknowledges assistance in this work by the Research Commission of the National Dental Association.

The first of these articles was by Ames in the Dental Review for 1914, the second by Paul Poetschke of the Caulk laboratories in the *Journal of Industrial and Engineering Chemistry* for March, 1915, the third by Dr. M. R. Smirnow of the Yale Medical School *Dental Cosmos* for November, 1915, the fourth by Dr. Raymond F. Bacon of the Mellon Institute in the *Dental Cosmos* for January, 1916, sixth by Paul Poetschke in the *Dental Cosmos for* March, 1916, and the seventh by Paul Poetschke in the *Journal of Industrial and Engineering Chemistry.* Since Ames' article was the the first to appear with the following reference to the subject it is clear why the other manufacturers with products differing from his have found it necessary to enter upon a campaign for the recognition of their products. Ames says, "It is, I trust, admissible in an attempt to clear up the situation, to refer to the contention on the part of some manufacturers that a blend of small percentages of some copper compounds with zinc oxid to enter into an oxyphosphate offers greater advantages as a sterilizing filling than one compounded almost entirely of copper oxid." From this you see that Ames claims that the sterilizing properties of his cement are due to the presence of the black cupric oxid in the proportions of approximately 100%.

Later in the same article he refers to a white copper cement which contains cuprous iodid, one of the whitest of the copper salts, in a very disparaging way.

He does not mention any name in connection with this cement but I happen to know that it was Caulk's product that he referred to, the Caulk Company being the pioneers in the white copper cement field the same as Ames was in the black copper cement field. Ames says of this white copper cement:

"Although zinc oxid cement *has little power to inhibit bacterial* reproduction, that little is in excess of any such power possessed by the silicious cements, in which the ingredients are such that bactericidal power is entirely nil. Oxychlorid of zinc cement would seem an advisable intermediary layer beneath a silicious cement when some slight inhibitory influence is called for.

"Coming now to the need of considering the so-called 'white copper cement,' it becomes necessary to judge of the value of an iodin compound as a cement ingredient. The powder of the 'white copper cement' is composed of about 95 per cent of zinc oxid, and about 5 per cent cuprous iodid, the whitest copper compound available. Iodin is a potent germicide and yet it cannot be demonstrated that a mass of freshly mixed cement containing 5 per cent of cuprous iodid contains enough of a potent *soluble* germicidal salt or enough free iodin to have any inhibitory power in excess of that *exerted by an oxyphosphate of zinc,* as is shown by reference to the Petri dishes containing cement upon inoculated agar for comparison.

"If a cement is porous, or if there is need of rendering it sterile within its own substance, it may be rendered sterile by containing some such ingredient as iodid of copper, but such an ingredient is not needed in a cement the texture of which is such that this internal sterilization is not called for. The impregnation of a material to be exposed to the fluids of the mouth with any such substance, *I consider a senseless temporary expedient.* If such a material is intended for pulp capping or root filling of anterior teeth, there is argument in its favor, as when sealed from the direct action of the oral fluids there is reason to expect a practically permanently sterile condition within a porous cement. Any potency of such a compound must come from liberation of iodin.

"I feel called on to show the influence upon a pellet of zinc oxid cement containing iodid of copper when it is placed in a sulphid staining solution, ammonium sulphid, for instance. The discoloration and disintegration seen in a short time would indicate that this simple test, and even the test of submitting a pellet to water, had not been made, and *when we observe the comparative inhibitive power of this* and some other cements when placed upon inoculated agar, it is hard to understand that the advertised bacteriological tests were ever intelligently made."

From this you will see that Ames does not think much of the white cement containing cuprous iodid made by Caulk Company. He calls the insertion of this ingredient "a senseless temporary expedient," and raises the question of whether "bacteriological tests were ever intelligently made" by Caulk Company to test the effect of this white copper salt in small quantities with their zinc cement. To the disinterested observer, however, he seems to have made one or two statements that are not very condemnatory to the white copper cement. In fact a careful perusal of the articles by Poetschke, Smirnow and Bacon following the appearance of Ames' article shows that these men have taken advantage of the things referred to by Ames in such a derogatory way, and have established their claims more firmly than otherwise would have been the case if Ames had not made them.

For example Ames says, "Although zinc oxid cement has *little power* to inhibit bacterial reproductions, etc.", and later in referring to Caulk's white copper cement with the cuprous iodid in it "when we observe the *comparative inhibitive power* of this and some other cements, etc." It may be noted that Ames does not say that the ordinary zinc oxid cement has no inhibitive power on bacteria, nor does he say that Caulk's white copper cement with the cuprous iodid in it has no inhibitive action. He implies that they are *comparatively negligible*. The fact, however, that Ames does not deny it, and that Smirnow *admits* it, and Poetschke and Bacon *claim* it shows that the bulk of the evidence is in favor of the light copper cements being germicidal in some degree, more than ordinary zinc cements. It seems then from this that the present controversy principally among the makers of these products is concerned with not merely germicidal qualities, but *comparative* germicidal qualities. When we consider *comparative* results we must be sure that we have the same conditions present in each case, and that we compare the same thing under different conditions. But this I fear is not exactly the status of the present controversy. For example, Ames says:

"By 'sterilizing properties of filling materials' it is, of course, not meant that a sterile condition of the oral cavity and its fluids can be promoted to any very appreciable extent. There is unmistakable clinical evidence, however, that there is a salutary effect upon tissue and fluids in immediate proximity to certain fillings from salts formed by an inappreciable waste thereof. Our *chief interest* is in what may happen *beneath* fillings.

"A state of sterility in which bacteria cannot exist and reproduce, is, as a general proposition, brought about as a moist condition by embalming, and as a dry condition by mummification. The latter state may be said to be embalming perpetuated by absence of moisture after sterilization has been accomplished.

"Mummification of more or less disorganized tissue beneath a filling and protected by it from the oral fluids, is best accomplished by a material capable of giving off some of its substance to help create a product of a penetrating nature, i. e., a creeping salt. If the product formed between the filling material and the exciting agents present, and infiltrated into the disorganized tissue, is such that there results a compact mass, sterile under the conditions, or even immune to destructive influences under altered conditions, the filling material with which this is possible, is valuable."

Later in the article he says "Having a cavity where it has been necessary to leave decalcified or semi-decalcified dentin over the pulp, this layer should be left saturated with moisture to the extent that it would be after only a reasonably careful use of absorbent pellets upon the other surfaces of the cavity." Later in the same article Ames says: "If, for instance, the freshly mixed filling has been a *real* oxyphosphate of copper, some soluble copper phosphate is leached from a portion of the mass, leaving that portion porous as compared to the balance of the mass, and therefore, in condition to more readily furnish germicidal salts."

From this it seems that Ames is discussing what happens when his copper cement containing approximately 100 per cent of cupric oxid is placed into cavities that have not had all the decalcified tissue removed. In fact, it would seem that he was referring to deciduous teeth where it is probably found most often necessary to fill teeth that have not been pretty well excavated and sterilized. He admits that there is unmistakable clinical evidence that there is a salutary effect upon tissue and fluids in immediate proximity to these cement fillings from salts formed by an unappreciable waste, but says our *chief* interest is in what happens beneath the filling.

In other words he considers what takes place after the filling has set of minor importance, though do not lose sight of the fact that he admits that a filling that is constantly giving off antiseptic salts has a good effect upon the joining and adjacent tissues, and as you will see from references to the subject by other manufacturers that this is not only a basis of their claim but they claim that a cement that will continue to give off antiseptic salts through its slight solubility is certain to be more antiseptic while in the plastic state. For example Pòetschke says:

"The object of using a hardened cement, one in which the chemical reactions involved have reached equilibrium, is that in this condition all of the cements to be compared have reached a fixed state. The results are not influenced by such factors as the setting time. A cement which could only act germicidally in a plastic condition, loses this property on setting, and would obviously be of no permanent value. Any liquid disinfectant applied to the cavity before inserting the cement would do as much work. It is the continued giving off of germicidal salts after the cement mass has set, which is the important factor. This is accomplished through the gradual yet *infinitesimal solubility* of the cement. A cement which is germicidal in the hardened state will certainly be germicidal in the plastic state, if not more so. From a practical standpoint, it would be impossible to determine germicidal efficiency accurately by using a cement in the plastic state. First: It would be almost impossible to use a fixed and uniform amount of such a plastic in all of the tests; any variation in the amount of the plastic would introduce a variable. Second; It would be practically impossible to control the state of the mix, since this is continually changing while in the plastic state, and therefore, another variable would be introduced. It is necessary to work with fixed conditions in order to obtain comparative results.

"The object of using the cement in the powdered condition in which the particles of powder are of as uniform size as it is possible to obtain them by careful sifting, is that a given weight of such a powder will represent a fairly uniform surface area of the cement. Since all of the cements in the tests are prepared in exactly the same manner, it is evident that this introduces a fixed condition.

"Saliva is used in the tests, since in this manner the various mouth organisms are used instead of a pure culture of one organism. Saliva is the proper media to be employed in tests of this kind, since it represents exactly the fluid with which the cement comes in contact in the mouth. The exposure of masses of cement to ordinary culture media does not represent the conditions to be obtained in the mouth."

It may be noted from this that Poetschke considers that Ames' claims for his oxyphosphate of copper cement being so much more pronounced than any light copper cement, based principally upon observations made while the cement was in the plastic state, are not well founded. In another part of the paper Poetschke calls Ames' paper "Pseudo-Scientific" in character.

Smirnow says of Ames' claims: "It does not appear that he has gone into this matter very extensively, as he mentions but two experiments, upon which he bases most of his statements, and these on the so-called plastic pellets."

Bacon says of Ames' tests: "The method is thoroughly correct, and we grant freely that it is preferable to any other; but when the comparative rate of killing is under consideration, as was the case in our tests, the difficulties encountered as a result of transferring an appreciable quantity of the antiseptic material to the culture media are very evident. For this reason, hardened cement and not plastic cement was used in our experiments. Since the use of hardened cement made the conditions of our experiments much more exacting than mouth conditions, we felt justified in modifying our technique to this extent."

Here we have statements from Poetschke, Smirnow and Bacon that they regard the hardened cement filling the practical form in which to test its antiseptic or germicidal properties, and an admission from Ames that a salutary effect is produced upon the tissues and fluids in close proximity to a hardened copper oxid cement filling when the cupric oxid is approximately 100%. This leads me to the conclusion that the present controversy over the comparative antiseptic or germicidal efficiency of the present cements in the market containing some form of copper is complicated by the fact that one of the men has considered the plastic state the important test and three of them the set cement as the most practical. When we consider that the liquids for most cements have their germicidal action pretty well established it seems obvious that the statements of Poetschke and Bacon, that if a cement were germicidal in the hardened state it would be more so in the plastic state, are generally correct. If we accept the evidence presented by the men mentioned, and our own, it would seem that we must consider the addition of cupric oxid, cuprous oxid, cuprous iodid, and possibly cuprous silicate and cupric phosphate capable of adding to the already germicidal properties of the common forms of zinc oxid cements, whether the tests be made in either a plastic or hardened condition, and in some cases, if not in all of them, in the proportion to which the copper salts are added. This leads us back to the apparently fundamental question in the controversy, viz., that of *comparative* germicidal properties of the different salts of copper under consideration, rather than mere germicidal properties which seem to be established.

Naturally we ask, is the cupric oxid used by Ames in quantities of approximately 100% and one of Caulk's cements in quantities of about 25% the most germicidal, or is the cuprous iodid used by the Caulk Co. the most active, or is the cuprous oxid used by the Stanley Chemical Co. and one of Caulk's cements or the cupric silicate used by Smith the most desirable in this respect; second, is the same quantity of copper used by each manufacturer, and third, is the nature of the cement such that, the actual germicidal coefficient of the copper salt employed, may be utilized for sterilization.

Concerning the first question relative to the comparative value of black, red and white salts of copper, in the same quantities and under the same conditions. Ames says that the *black cupric oxid* cement is the "real oxyphosphate"—Poetschke is rather non-commital on this point but speaks very highly of the *white cuprous iodid*—Smirnow says that the *red cuprous iodid* excelled all other copper salts tested—Bacon makes the statement that all of the cements tested will sterilize the saliva within a reasonable time. At my suggestion *R. M. McCormick, M. S., carried out some tests in my laboratory at the University to determine whether or not black cupric oxid was more germicidal than light cuprous iodid uncombined with anything else, when mixed with different quantities of saliva and incubated for 24 hours and plated on plus 1 agar. While the amount of work done would not warrant a statement relative to the germicidal value of these two different colored salts of copper I feel perfectly safe in saying that both are very germicidal in their proportions possible up to one of the copper compound and twenty-five of saliva. When one gram of either of these salts was shaken with twenty-five cc. of saliva and incubated for twenty-four hours not a sign of a growth was visible on agar when plated. It seems from this and some other tests we have made that this light compound of copper is germicidal. Possibly there are others. At least the writer is not willing to accept the present evidence available that the light compounds of copper are not germicidal. Since the manufacturers are using the black, red, and light salts of copper in different proportions in their cements, and the physical properties, especially solubility, varies with each makers' cement, it is very difficult to draw any satisfactory conclusions, even if we were certain of the comparative germicidal value of the different compounds of copper under identical conditions. Besides having the makers of these cements differing on what should constitute a proper test for germicidal efficiency there is the question of the cement in which the copper compound is incorporated varying to such an extent that the copper compound is not in contact with the tissues of the mouth under the same conditions. Ames is using nearly 100% of cupric oxid in his copper cement, Caulk Co. is using about 25% of the same salt in their black copper cement, about 8% of cuprous oxid in their red one, about 10% cuprous iodid in their Copr-Zinc, and 2% of cuprous iodid in their light copper cement. The Smith Co. is using not over 2% of some copper compound probably the silicate or phosphate. The Stanley Chemical Co. are using probably about 25% of cuprous oxid in their red copper cement. There may be other proportions used by other manufacturers of these products but the writer is not familiar with them at present. From this you see that quite a variety of percentages are presented for use with three and probably four different compounds of copper in the list, and these different compounds of copper incorporated in as many different forms of cement.

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*Working under the direction of the University of Michigan and Research Commission of the National Dental Association.

If we knew that cupric oxid was equally efficient as a germicide and if the properties of the cement were the same as other cements we would expect Ames' to be the most germicidal of all copper cements because it has the most copper in it, but as it is, the dentists of this country must decide what they consider constitutes the most practical test for the germicidal value of a cement and demand that the test be met by the makers of these products with percentages varying from 2% to 97% under varying conditions. In the same way we would expect the black and red cements of Caulk's and Stanley Chemical Co. to be next in value because they come next in quantity used, and the light cements with their percentages of copper running as low as two we would not expect much germicidal efficiency. From the statements in the literature by Poetschke and Bacon one would be led to believe that the light copper cements were sufficiently germicidal. Poetschke also says that germicidal efficiency is but one of many properties of a dental cement. This I believe is the phase of the controversy that will receive attention as more work is done on the subject by the profession, for it is in harmony with the recent work by all the manufacturers of cements for other purposes. No one property is allowed to entirely obscure other properties that are desirable under other or the same conditions. Obviously, when this is followed out it seems quite possible that the nature of the cement may be such that the actual germicidal co-efficient of the copper compound employed, whatever this may prove to be, may not be utilized to its fullest extent for the purpose of sterilization. Whether or not the profession is willing to accept a copper cement that may have had its germicidal efficiency developed to the fullest extent if it is jet black in color or a dull red in color, or some other disagreeable shade, will depend largely upon whether more desirable shades have a sufficient though possibly not equal germicidal value. It is but natural that both germicidal efficiency and desirable color be demanded unless it is shown conclusively that both cannot be had along with other desirable properties, and men fail to realize that there are places in the practice of everyone that *demand* real germicidal cements just as much as root canals demand aseptic fillings, teeth be made free from caries, and foci of infection about the tissues under the care of the dentist be eliminated. First we must find out which of the cements has a sufficient amount of germicidal efficiency to prevent the growth of organisms upon or in the immediate vicinity of the cement lines of crowns, bridges, etc., whether they be fixed or removable if they are to remain in the mouth for a period of years, if we are to be consistent in our advocacy of better hygiene in the mouth and fewer foci of infections about the necks of teeth. Having accomplished this we should, in my opinion, urge the use of them wherever consistent with the other demands of the dentist. This seems to be a period in dentistry where a great amount of the mechanical part of it is of such a nature that cement is involved in it. To meet the demands of the profession, as almost every phase of it has changed, the makers of dental cements have made some marked changes in their products.

ZnO	Basic Zinc Phosphates Permanent (so called)	Class I—Modified by high Calcination or Nitration of Zinc Oxid.	Justi and others.
		Class II.—Modified by medium high Calcination of Zinc Oxid, or a mixing of two or more grades.	Fellowship and others.
		Class III—Modified by the addition of Bismuth Salt to the Zinc Oxid.	Ames and others.
		Class IV—Modified by the addition of Salts of Bismuth and Magnesium to the Zinc Oxid.	Petroid and others.
		Class V—Modified by the addition of a salt of Sillicon to the Zinc Oxid.	Harvard and others.
CuO	Black Copper Phosphates	Class I—High in Copper (Ames and others).	
		Class II—Medium high in Copper (Caulk and others).	
Cu_2O	Red Copper Phosphates.		
Cu_2l_2 $CuHpO_4$ $CuSiO_3$	White Copper Phosphates (Caulk, Smith, and others).		
CaO Al_2O_3 SiO_2 BeO_2	Silicate Cements.		

CLASSES OF CEMENT POWDERS.

ANALYSIS OF RAPID SETTING PETROID LIQUID TAKEN FROM THE OPEN MARKET.

Determined as	Pct.	Pure	Pct.	85% Pure	Pct.
P_2O_5	48.70	H_3PO_4	67.30	H_3PO_4	79.30
Al_2O_3	5.10	$Al(OH)_3$	7.95	$Al(OH)_3$	9.35
HC_1	0.37		0.37		0.37
H_2O	45.83	H_2O	24.38		10.98

SPECIFIC GRAVITY OF THE LIQUIDS ACCOMPANYING PETROID CEMENT.

Rapid setting	1.69
Medium setting	1.60
Slow setting	1.25

PETROID LIQUID.	AMES LIQUID.
Rapid = 4.40 Al_2O_3	A = 6.42
Medium = 4.82 Al_2O_3	B
Slow = 5.24 Al_2O_3	C
	D = 7.47% Al_2O_3

Reference to the outline of the classes of cements now in the market shows that the manufacturers have decided for the present at least that aluminum hydrate and water are about as desirable modifiers of phosphoric acid as present knowledge of the subject permits the use of. It may be seen, however, that the powder portion of these products may be modified in three or four ways, yielding cements which meet the principal demands of the dentist, but on close examination it is found that each different form of modifier gives a cement that meets *certain demands* better than another cement with a different modifier.

Regardless of what particular line of properties any manufacturer has worked along I doubt if any are willing to admit that they have not watched closely the solubility of their product, and yet the makers of the light copper cements claim that with their 2% of one of these salts there is sufficient solubility to allow this amount of copper to sterilize within a few hours.

Regarding the medicinal effect of copper cements Ames says "there is clinical evidence of such medicinal effect without appreciable waste of substance." Some of the other writers make similar references to the question of solubility. Poetschke used hardened pellets that had been broken up and carefully bolted to establish a fixed and uniform surface area of the cement, which it undoubtedly did to as great or greater extent than our tests have, but by so doing he also exposed a greater surface area to the solvent action of the saliva and this to the writer seems like a greater error than the variations in the hardened pellets themselves, and did not present a condition as near to that of a filling in the mouth as the pellet unbroken does.

As I study the solubility of some of the recent cements I am more and more of the opinion that the manufacturers are watching the solubility of their products closely taking in to consideration at the same time the other properties that the dentists are demanding, and I am getting the feeling, though open to conviction, that the question of solubility and germicidal properties are closely associated. If this is true it appears like an impossible claim to make that percentages as low as 2 of a copper compound will be very active as a germicide when incorporated in one of these so-called permanent cements. It does not seem that the controversy need be confined to dark compounds of copper against light compounds of copper for it seems that cuprous iodid and possibly other light compounds are very germicidal, but may be discussed from the standpoint of *solubility* and *percentage used* after we have determined the relative value of all the copper compounds available for the purpose. If two cements are equally insoluble and one contains 2 per cent of a copper compound and the other contains 5 per cent, 10 per cent, 25 per cent or 50 per cent the copper compounds being equally efficient, it would seem that the higher percentages would be the more efficient. This is the way it appears to those of us who have watched some tests for the purpose of determining which, if any of the copper cements in the market were really effective in producing a condition of sterility around cement fillings and crowns, bridges, etc. While it seems a difficult problem to determine what constitutes the proper proportion of saliva to filling it seems that the following tests are somewhat indicative of the general tendencies of the products in question to produce sterile conditions, if they do not prove to be quite correct. However this may be I trust that they will bring forth suggestions that will aid us in arriving at the truth of the matter as we continue the work.

We chose to use the hardened cement pellet for the reason that after placing the manner of testing these products before several dentists and one or two very capable bacteriologists it was quite generally agreed that what was of most interest to a dentist was the effect of the filling after it had hardened, or if it were a crown or bridge what the effect of the hardened cement would be upon tissues in contact with or adjacent to it. We therefore made some 4 mm. x 6 mm. pellets by placing the plastic cement into some 4 mm. glass tubing which had been cut to 6 mm. in length. After the cement had been allowed to set in the air at 23° C. for twenty-four hours it would shrink enough to allow it to be removed from the glass tubes without much trouble. These fillings were then cut to 6 mm. in length by removing some of the cement that had overlapped at the end of the tube that we had filled. This gave us a reasonably uniform surface area of the cement to be exposed to the saliva. By determination we decided that 1.0000 gram of powder would require about 1.1500 grams of liquid to make a mix that was required for the retention of crowns, etc., when the temperature was about 23° C., and used these proportions with all the cements except Ames, which we made by using 0.8300 grams of liquid.

Saliva was then taken from one person with the aid of unflavored paraffine and diluted with sterile water to proportions of one of saliva and four of water. Ten cubic centimeters of this dilution was then taken and placed into sterile test tubes and the 4 mm. x 6 mm. hardened cement pellets added. 0.1 cc. of the original dilution was plated on plus 1 Agar as soon as the tests were started for a control. At the end of 7, 14 and 24 hours 0.1 of a cubic centimeter was taken from each of the tubes containing the fillings and diluted saliva and plated on plus 1 Agar for 24 hours at 37° C. and counted and tabulated as follows:

Kind of cement	7 hrs.	14 hrs.	24 hrs.	Efficiency
	Exposure of saliva and bacteria per cc.			
Ames' Black Copper...	0	0	0	100
Fleck's Red Copper...	141,750	20,250	20,450	98.9
Caulk's Black Copper..	202,500	81,000	40,500	97.9
Caulk's Red Copper...	213,000	85,000	41,000	97.7
Caulk's White Copper..	405,000	141,750	81,000	95.9
Smith's White Copper..	810,000	101,250	81,000	95.9
Caulk's Petroid.......	1,012,500	141,750	121,500	93.9
Control	4,050,000	405,000	243,000	87.8

Plate taken from original solution 2,000,000 bacteria per cc.

The growths at the first countings were large but in the later stages of the tests no difficulty was experienced in counting because the bacteria content had been greatly lowered in all cases.

It is not without a knowledge of the opinions of some of those who have done some work along the same line that we choose these dilutions.

In fact, it was after careful consideration of the matter by some competent bacteriologists that we decided to use the percentages that we did, so that we could show a comparative rate of killing the bacteria in this saliva.

REPORT ON DENTAL SCIENCE AND LITERATURE.*

BY P. G. PUTERBAUGH, M. D., D. D. S., CHICAGO, ILL.

In making a survey of the evolution of dental science and its literature, one must be impressed with the great advance in the last few years.

Dentistry, while growing constantly in its scope and usefulness, is comparable to all things natural, inasmuch as there are alternate periods of growth and rest; periods of great advancement following the discovery of some new process, appliance, or principle, followed by more or less latent periods, during which the profession as a whole is brought up to the new standard.

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*Read before the Illinois State Dental Society, May, 1916.

The past year has been occupying the latter phase of the cycle, in which we have been shaping our point of vision to meet the new position of responsibility that we now find thrust upon us, viz., that of guarding one of the great portals of entry for infections, to meet the demands of the awakened medical profession, who for the first time in history are beginning to realize the necessity of skilled stomatologists.

Dental school-inspection has in no small measure opened the way for co-operation between these two professions, and by pointing out the results of defective oral conditions upon the mental and physical development of the individual, has served to implant in the minds of the laity the necessity for better personal care, as they have never understood it before.

Many excellent articles upon pyorrhea and alveolar abscess have appeared in the lay papers, from the pens of both dentists and physicians, and while some exaggerated claims have been made relative to the merits of emetin as a pyorrhea cure, the laity has invariably been advised to consult their dentist for local treatment, and the results have always been to the patients' benefit.

RADIOGRAPHY.

Many meritorious articles upon the value of radiographic findings in assisting to a diagnosis, have appeared in dental magazines, among which should be mentioned:

A Talk About Dental Radiography, by Howard R. Raper, D. D. S., in the August, 1915, DENTAL REVIEW, and another,

X-Ray Aid to Diagnosis, by the same author in the May, 1915, *Dental Cosmos.*

Dental Radiography, by George E. Johnson, D. D. S., in the October, 1915, *Dental Summary,* is well illustrated and presents typical cases to cite the value of this agent in confirming the clinical diagnosis.

I feel certain that much chagrin will come to many of the physicians and dentists who today are making positive diagnoses from radiographic films alone, without first thoroughly going over the clinical findings. It is true that the bone condition may be accurately estimated by a radiograph, but whether a rarified area contains pus or connective tissue, is not within its power to demonstrate; neither can a positive statement be made as to the vitality of the dental pulp.

Dr. Raper says: "Let us face the fact in the future, that X-rays will not assist us to a definite diagnosis in all cases, and that unless we exercise the keenest judgment they are often misleading. For, like all other things in the world, they have their limitations and their faults, but withal they remain our greatest single aid to dental diagnosis."

PROSTHESIS.

Prosthetic dentistry has been favored by a number of good papers, among which are:

The Design and Retention of Partial Dentures, by Dr. Douglas Gabell, in the March and April, 1916, *Dental Cosmos.*

Some Problems in Mounting Artificial Dentures, by George H. Wilson, D. D. S., in the March, 1916, Dental Summary, in which the author recommends the Hall articulator, and describes the technique of its use.

Removable Partial Dentures, by C. H. Coltrin, D. D. S., in the September, 1915, Dental Review, read before this Society last year.

Masticating Efficiency in Natural and Artificial Teeth, a series of papers by Alfred Gysi, D. D. S., and George W. Clapp, D. D. S., in the *Dental Digest,* affords an opportunity for "brushing up" in the field of anatomical articulation.

Cleft Palate Obturators, by W. H. O. McGehee, D. D. S., M. D., in the December, 1915, *Dental Cosmos.*

Closed Mouth Impressions, by Samuel G. Supplee, D. D. S., series in the *Dental Digest,* offers perhaps the latest and best thought upon the adaptation of modelling composition to the oral tissues while they are in a condition of rest, and if his technique is followed, must lead to more uniform results than have been accomplished with the formerly accepted methods of impression taking.

CROWN AND BRIDGE WORK.

The once popular telescope crown, guaranteed for a lifetime, has undergone a radical metamorphosis, and the literature bearing upon this subject signifies an earnest endeavor to present methods whereby crown and bridge construction may be performed without the sacrifice of teeth that formerly resulted, as a consequence of gingival irritation occasioned by badly fitting bands.

The following articles are representative:

Some advantages of Jacket Crowns, by W. A. Capon, D. D. S., in the September, 1915, *Dental Cosmos,* illustrating their employment in malposed teeth, and teeth with retracted gum margins.

A Consideration of the Problems Involved in Removable Bridge Work, by Karl G. Knoche, D. D. S., in February, 1916, DENTAL REVIEW.

Why Removable Appliances Fail, by Dr. F. Ewing Roach, in the July, 1915, DENTAL REVIEW.

Modern Attachments for Bridgework and Stabilizers for Loose Teeth, by Jas. Kendall Burgess, D. D. S., in the December, 1915, *Dental Cosmos,* is well illustrated and emphasizes the value of pin inlay attachments.

Bridgework Conducive to Health and the Instruments for Constructing It, by Herman E. S. Chayes, D. D. S., in the June, 1915, *Items of Interest,* introduces a parallelodrill for bridgework.

The Shoulder Crown, by George S. Hershey, D. D. S., and Crown and Bridgework, by W. O. Hulick, D. D. S., in the January, 1916, *Dental Summary,* are worthy articles. Dr. Hulick says: "Regarding bands for the single crown, many operators differ in opinion, even though they fit perfectly, and be that as it may, good results—lasting results, if you please—are obtained either way with only occasionally a split root, which may and has happened with or without a band, and is usually due to faulty occlusion or accident, and not from the method employed.

It is therefore my opinion that inability to fit a band properly is the only reason for condemning them, either for porcelain teeth or gold cap crowns." He further states: "I would therefore again urge anyone in doubt to improve his technic and knowledge of application and continue to employ methods within his capability, for the object after all in our life work is service—the best we can do, and for the longest possible time."

PYORRHEA ALVEOLARIS.

To anyone interested in reviewing the literature on pyorrhea, we recommend the following:

Pyorrhea, by A. Clifford Braly, D. D. S., in the February, 1916, *Dental Summary.*

The Treatment of Pyorrhea, by J. P. Carmichael, D. D. S., in August, 1915, Dental Review.

Facts, Fads and Follies Concerning Pyorrhea, by C. E. Bentley, D. D. S., in the April, 1916, Dental Review.

Some Thoughts on Pyorrhea Alveolaris, by Emilo Agostini, D. D. S., in the June, 1915, *Dental Cosmos.*

The Treatment of Interstitial Gingivitis and Pyorrhea Alveolaris, by Eugene S. Talbot, in the May, 1915, *Dental Cosmos.*

Mercurial Treatment of Pyorrhea Alveolaris, by C. S. Copeland, D. D. S., in February, 1916, *Dental Cosmos,* in which two to four intramuscular injections of mercury succinamid, in doses of 4/5 to 1 gr. are said to be followed by a remarkable reduction in the pus production and hyperemia of the gingivae.

The Irrationality of Bacterial Vaccines in the Treatment of Pyorrhea Alveolaris, by Arthur H. Merritt, D. D. S., in the January, 1916, *Dental Cosmos.* Claims that the varieties of strains are too varied for stock vaccines, and that vaccines have little effect on surface ulcerations.

Articles upon Emetin in the Treatment of Peridental Suppurations, by Allen J. Smith, M. D., and M. T. Barrett, D. D. S., M. S., in the November Dental Review, will interest many who have used the various preparations of ipecac. I doubt, however, if a large proportion of the profession today will agree with their statement that "As has been clearly demonstrated their (the amebae) destruction by emetin is followed by the cessation of suppuration."

What Science Reveals, by H. E. Bliler, D. D. S., in the November, 1915, *Dental Summary,* is a good example of what science fails to reveal.

After giving a general quotation from Parke, Davis & Co. relative to the value of elimination, together with an unsigned testimonial purporting to emanate from a pyorrhea specialist in Denver, Colorado, who says, "I am getting some fine results with my local treatments alone using improved instruments and methods, but I find I cannot stop the flow of pus." Remarkable! Following this quotation, Dr. Bliler continues: "This clearly proves that pyorrhea is of systemic origin, for I stop the flow of pus in every case, and do not even clean the tartar off in many cases."

The most fortunate part of this paper is that the "Castor Oil Highball" will run little risk of being over indulged in by the smart set.

The Amœba, by Eugene S. Talbot, is most interesting and must be somewhat discomforting to certain men who are "curing" pyorrhea by the elimination of the endameba buccalis. Dr. Talbot says: "Does the ameba produce Interstitial Gingivitis, a disease which causes inflammation of the gums and alveolar process, causing absorption of bone, loosening of the teeth and eventually their exfoliation? To those who wish to study the ameba in its relation to disease, let me save you the trouble and effort by answering this one question, that it does not."

The Present Status of Our Knowledge of Pyorrhea Alveolaris and Its Cure, by Richard Riethmüller, Ph. D., D. D. S., in the December, 1915, DENTAL REVIEW, says: "Let us become reconciled to the fact and thought, that shotgun methods of pyorrhea cures have not as yet, perhaps never will be discovered, and that he who wishes to treat pyorrhea successfully had better become a skillful deft operator first, instead of pinning his faith to a hypodermic syringe."

It would seem that after all, the pursuit of many much-lauded so-called cures, has led to naught, and that when an operator has removed all deposits from the teeth and has curetted the soft tissues lining the pockets, the case is then in the hands of the patient, and his cure or recrudescence will depend, in a great measure, upon how well he performs his daily routine dental toilet.

METASTATIC INFECTIONS.

More papers have appeared upon this subject than any other one topic. Some of the most worthy are:

The Interrelation of the Teeth and the Eye, by Wm. T. Davis, M. D., F. A. C. S.

Dental Pathology and Its Relation to Systemic Disease, by T. A. Leonard, D. D. S., in the February, 1916, *Dental Summary*.

The Relation of Mouth Infection to Systemic Disease, by Martin H. Fischer, D. D. S., in the August and September, 1915, *Dental Summary*.

Tonsil and Adenoid Pathology and Its Influence upon Health and the Development of the Oral Cavity, by William H. Clevenger, M. D., F. A. C. S., in the October *Dental Summary*.

Precautions to Be Observed in the Care of Mouth Infections, with Regard to the Preservation of Health, by Stirling Hewitt, D. D. S., in the March, 1916, *Dental Cosmos.*

Oral Osteitis in Its Relation to Arthritis, by Byron C. Darling, A. B., M. D., in the July, 1915, *Items of Interest.*

Blood Findings in 162 Consecutive Cases of Chronic Oral Infections Associated with the Teeth, by Dr. W. H. G. Logan, in the December, 1915, *Items of Interest.*

All of the above enumerated papers have been written for the evident purpose of conveying to the busy practitioner the now accepted truth that many of the systemic maladies that formerly were thought to arise from disorders or perversions of metabolism are now known to be infections; and that these infections arise not infrequently from the peridental tissues.

The time when the dentist could complacently overlook chronic suppurative processes and allow the systemic defences to take care of them as best they could, has passed forever. Conservation of the body forces should now concern the profession more than ever before in its history.

I fear that some disappointment may come to the public, because of radical assertions made by certain over zealous workers, who promise speedy cures of diseases originating from oral conditions, immediately upon the correction of these primary foci. It would be well, therefore, to be just a little more guarded in the future, about promising immediate relief, from dental treatment alone, after the infection has once broken down the barriers of resistance and become generalized throughout the system.

However, the time for preparedness is in time of peace, and we should, in the light of our present knowledge, be more energetic in our search for, and the correction of gingival irritations, and more thorough in our root canal technique, that the primary focus of infection about the teeth will not have the opportunity to confront us.

OPERATIVE DENTISTRY.

The following articles are worthy of a second reading:

Inlays, Gold and Synthetic Cement Restoration, by S. F. Jacobi, D. D. S., in the December, 1915 *Dental Summary.*

Cavity Preparation as a Treatment of Dental Caries, by Edgar D. Coolidge, D. D. S., in the November, 1915, *Dental Summary.*

Restoration of the Normal Masticatory Function of Decayed Teeth, by A. H. Ketcham, D. D. S., in *Items of Interest.*

Factors of Importance in the Construction of Cast Gold Inlays, by Marcus L. Ward, D. D. S., in the May, 1916, *Dental Cosmos.*

The Possibilities of Modern Amalgam, by Herbert Locke Wheeler, D. D. S., in the July, 1915, *Dental Summary.*

Standardizing the Amalgam Filling, by Walter G. Crandall, D. D. S., in the July and August, 1915, *Dental Summary.*

Restoring Masticatory Function with Carved Gold Inlays, by Dr. R. Ottolengui, in *Items of Interest,* recommending the accentuation of contacts, sulci, and fissures, in filling restorations.

The Place of the Silicates in Dentistry, by Charles C. Voelker, D. D. S., in the March, 1916 *Dental Summary,* is a most excellent paper, with the following advice for their employment: "They have largely taken the place of gold fillings and of porcelain inlays in simple approximal, buccal, labial, and lingual cavities, especially in the anterior teeth. On the occlusal surfaces of bicuspids and molars and even the incisal edges of teeth, they may often be used with good results. In cases where gutta-percha and oxyphosphate cement fillings were formerly used as more or less temporary expedients or when inexpensive fillings were required, the silicates give better results because of greater durability and esthetic qualities and only slightly greater cost to the patient. They must, however, be employed with great circumspection in compound cavities, as the incisal corners of anterior teeth and approximo-occlusal restorations."

Operative Procedures in Relation to Dental Caries and Diseases of the Investing Tissues, by Dr. Arthur D. Black, in the December, 1915, *Items of Interest,* contains this important statement:

"Carefully compiled statistics show that in the mouths of young adults—between the ages of twenty and thirty-five—there are, on the average, about eight areas of gingivitis per mouth, and that more than half of all such inflammations are due to dental operations, in the performance of which the dentist has failled to restore proper contours or contacts. These inflammations are the beginnings of disease involving the peridental membrane, and a full understanding of the pathology of both will result in greater care in each operation performed.

We must presume that dentists have generally failed to recognize and appreciate the connection between the imperfect operation and the pathological condition which has resulted, because if the relationship were appreciated, we can hardly believe that so large a number of cases would continue to present in which the imperfect dental operation is the direct cause of the disease of the peridental membrane."

The Interproximal Space and Tooth Form, by Charles E. Woodbury, D. D. S., in the July, 1915, DENTAL REVIEW, is most excellent. The author makes a plea for preserving the normal interproximal space and gum papilla throughout life, and says, "It is really more important to perfect ourselves in the science and technique of the daily operation, than to devote our best efforts to those operations which we only occasionally perform. We earn one hundred dollars making amalgam fillings where we make one treating disease of the antrum. We benefit our patients far more making good crowns and bridges than we do when successfully extracting impacted third molars."

The Care of the Deciduous Teeth, by W. I. Copeland, D. D. S., in the December, 1915, *Dental Summary,* is well written and practical. The recommending of silver nitrate applications to arrest caries in sensitive cavities in deciduous teeth is commendable. We must admit that the proper care of children's teeth has been shunned by the profession too long, because we have felt that the energy and time required would not be paid for in dollars and cents.

ORAL SURGERY.

Importance of Early Diagnosis of Malignant Tumors of the Mouth, by Vilray P. Blair, M. D., in the July, 1915, DENTAL REVIEW.

Diseased Tissues of the Oral Cavity, by W. C. Smith, D. D. S., in the November, 1915, DENTAL REVIEW.

Neuralgia, by Dr. D. H. Squire, in the June, 1915, *Dental Cosmos.*

Ankylosis of the Jaw, by John B. Murphy, in the February, 1916, *Dental Cosmos,* with photographic illustrations of a number of cases operated, showing by marked contrast, the excellent results obtained by surgical operations in these cases.

Mesothelial Tumors of the Jaws, by Robert H. Ivy, M. D.,

D. D. S., in the September, 1915, *Dental Summary,* are all well written and in line with the modern tendency of insisting upon early diagnoses by the dentist of neoplasms, before they become so far advanced as to be inoperable.

Root Resection and Apical Canal Filling After Resection, by Carl D. Lucas, D. D. S., in the March, 1916, *Dental Summary,* is interesting, inasmuch as the author recommends a large flap operation, removing enough process to allow sufficient access to prepare a cavity in the resected root end, filling same with amalgam, and closing the wound with sutures, without drainage.

Because of the necessarily large opening required for access, this paper will not appeal forcibly to anyone who in addition has observed the irritating effect of amalgam upon soft tissue when used to fill gingival cavities in teeth. Then, we wonder why it is necessary to make a complicated surgical procedure out of one commonly performed by the average dentist in a simple and satisfactory manner.

Fractures of the Inferior Maxilla, by Henry S. Dunning, M. D., D. D. S., in the November, 1915, *Dental Summary,* comprises an instructive report, based upon the management of 1065 cases.

Briefly summarized, he finds that 98% of these fractures are compound. Jaw fractures occur ten times more commonly in men than in women. Two cases out of his series of 1065 failed to unite with simple wiring, or splints. Abscesses with sinuses on the face are common complications. Outside splints are seldom needed. Surgical wiring through the body of the bone should not be done. Lane plates give good results but are unnecessary. Advises use of cap splint or arch splint if sufficient teeth are present in the arch, and interdental splints in children and in edentulous mouths. Non-union, while rare, is due to faulty or delayed treatment.

LOCAL ANESTHESIA.

Among the many articles worthy of mention are:

Local anesthesia, by Stephen P. Mallet, D. M. D., in the November, 1915, *Dental Summary.* A nicely epitomized article, reviewing Fischer's work. However, I cannot concur with his instruction to use the pen grasp in the insertion of a hypodermic needle, because of the pain produced; feeling that this part of the operation may be best performed by holding the syringe in such a manner that a small amount of the anesthetic solution may be injected while the needle is advancing through the tissues. This minimizes the pain so frequently complained of when the needle is inserted fully before any injection is made. On the whole, however, the paper is commendable.

Conductive Anesthesia, by Dr. George T. Gregg, in the December, 1915, *Dental Summary.*

Local Anesthesia in Operative Dentistry, by Leo Stern, D. D. S., in the September, 1915, *Items of Interest,* are well written, and

Modern Methods of Producing Local Anesthesia, by Herman Prinz, M. D., D. D. S., in the July, 1915, *Dental Summary,* covering well the advantages, disadvantages and technique of intraosseous, conductive, and infiltrative methods, is probably the best paper of the entire year.

While, as I have previously stated, the literature bearing upon the subject of local anesthesia is profuse, not one improvement has been added to the original technique of Dr. Guido Fischer, given a few years ago, and outlined so admirably in his book entitled Local Anesthesia in Dentistry. Publicity to conductive anesthesia is necessary, however, because of its apparent radical departure from former anesthetic methods, and the tendency for the profession to hesitate about its adoption; but when followed with an ordinary degree of skill it is capable of great possibilities in the hands of any dentist.

High Pressure Anesthesia for Cavity Preparation, and Pulp Removal, by W. T. Jackman, D. D. S., in the September, 1915, *Dental Summary,* nicely outlines the technique for this once popular form of desensitization.

ORAL PROPHYLAXIS.

This has been one of the most profusely discussed subjects of the year.

Something in Oral Prophylaxis, by F. H. Skinner, D. D. S., in the April, 1915, DENTAL REVIEW, is worthy of mention. The author places the responsibility for the removal of the deposits upon the dentist. Then shifts the burden to the patient, believing that the home care has everything to do with the prevention of a recurrence.

A Prophylaxis Symposium, in the May, 1915, *Items of Interest,* compiled from numerous authors, is by far the best single issue upon this subject. Profusely illustrated, clearly depicting the modus operandi of attaining and maintaining oral hygiene, it should be upon every dentist's reception room table.

Oral Prophylaxis in Its Relation to Pyorrhea, and Its Treatment, by Dr. Thomas B. Hartzell, in September, 1915, DENTAL REVIEW, is a most scientific paper.

Prophylaxis, medically defined means prevention of disease, and I often wonder just what the average dentist has in mind when he talks "prophylaxis" to his patients. I fear that too many of the five-dollar-an-hour-prophylaxis sittings bear a very close resemblance to the one-dollar cleanings of a few years ago. Are we awake to our increased responsibilities that go with the increase in fees?

From a careful perusal of many articles in various journals, I arrive at the conclusion that this term should cover the operations of removing stains and calcific deposits from the exposed surfaces of teeth; the obliteration of rough edges of crowns, and overlapping fillings; the restoration of the normal mesiodistal diameters of the interproximal spaces, and properly locating the contact points; the polishing of enamel surfaces, and instruction to the patient as to the best manner in which he may preserve this condition after it has been once established.

I am sure that as yet only a small proportion of the profession realize the necessity of these procedures, and are willing to devote the necessary time required for their accomplishment. When the dental and medical profession are brought to realize the importance of a good denture, and a body free from toxic influences and have pointed out to them the widespread havoc wrought by pyorrhea alone, we will delve more deeply into this subject of prophylaxis, which seems to be the absolutely essential step to ward off this ever recurring malady.

ORTHODONTIA.

The so-called "schools" of orthodontia are rapidly passing into oblivion and the literature bears the stamp of men who are more interested in the correction of dento-facial deformities than continuing factional jealousies and ideas.

The slight buccal pressure of the mouth breather has demonstrated what the application of gentle continuous pressure will do to the dental arch, and the similar resilient force of small gauge alignment wires has been found to afford an ideal form for the application of force in tooth movement, and will undoubtedly continue to grow in favor.

The following excellent papers will be found of interest to everyone.

A System of Positive and Painless Tooth Movement, by Ray D. Robinson, D. D. S., in October, 1915, DENTAL REVIEW.

The Relation of Orthodontia to Dentistry, by Frederick Bogue Noyes, A. B., D. D. S., in October, 1915, DENTAL REVIEW.

A consideration of the question of Early Treatment of Malocclusion, by Frederick C. Kemple, D. D. S., in June, 1915, *Items of Interest.*

A New Method for Indicating Normal and Abnormal Relations of the Teeth to the Facial Lines, by J. A. W. Van Loon, M. D., D. D. S., Utrecht, Holland, in the September and October, 1915, numbers of the *Dental Cosmos.*

A Further Study of Some Etiological Fractors of Malocclusion, by Milo Hellman, D. D. S., in February, 1916, *Dental Cosmos.*

The latter excellent articles stating that 83% of malocclusions are in bottle-fed children.

" 'Anomalies of teeth and jaws may be produced in lower mammals by artificial disturbances of internal secretions." The author further arrives at the conclusion that "Probably internal secretions play a large part in development of enamel and shaping of dental arches.' "

ROOT CANAL FILLING.

Never in the history of medicine has dentistry so closely approached the treatment of constitutional disease as it has today. Sixty years ago the first systemic medication by means of a hollow needle, hypodermically, was attempted and it has taken all of this time for both professions to awaken to the fact that infectious material serving as an etiological factor in disease production, may be similarly forced into the circulation via. the root canal route.

As a result of this awakening, the writings of the last year upon root canal treatment and filling have been both abundant and profuse.

That Dr. M. L. Rhein recognizes the foregoing fact is evidenced by the title of his illustrated paper in the November, 1915, *Items of Interest.* The Correct Treatment of Pulpless Teeth Must Eliminate the Possibility of Periapical Reinfection.

Another good paper is, "The Securing and Maintaining Asepsis During Canal Operations, by Alfred P. Lee, D. D. S., in August, 1915, *Dental Cosmos.*

Significance of the Pulp Canal Operation, by Elmer S. Best, D. D. S., in the November, 1915, *Dental Summary,* is an excellent article making a plea for aseptic work—giving his technique in detail.

Root Canal Preparation, by J. R. Callahan, D. D. S., is a most worthy paper. The author has given this subject his careful study for twenty-five years, and with his instrumentation, obtaining an unobstructed approach to the canal, and enlarging with 40% sulphuric acid, the roots can be perfectly filled in a high percentage of cases. His rosin solution, followed by gutta percha cones form excellent root canal fillings, but canals exposed and enlarged by his method may be well filled by any standard technique.

Radiography has done much for us in this special field, and it is clearly evident that in order that canals may be filled securely, access must be first obtained, and the canals enlarged sufficiently to permit the passage, not only of broaches, but of root canal pluggers as well.

In "Root Canal Filling," by Forrest H. Orton, D. D. S., in November, 1915, *Items of Interest,* we find the trite statement, "The more canals men try to fill, the more canals will men fill." The day of passing up small canals as being unworthy of effort has passed, and the new era says that either these must be filled or the tooth extracted.

BOOKS.

Prosthetic Dentistry, by James Harrison Prothero, D. D. S., Chicago, second edition, 1200 pages, 1400 illustrations, Medico Dental Publishing Company, Chicago.

The most comprehensive work written upon the subject, covering porcelain and metallic inlays, crown work, bridge work and metallurgy. Profusely illustrated, easily placing it in a class by iself and worthy of first place in every dentist's library.

Oral Surgery, by Truman W. Brophy, M. D., D. D. S., L. L. D., Sc. D., F. A. C. S., 1065 pages. P. Blakiston's Sons, Philadelphia.

Dr. Brophy has been collecting material for this book for the past twenty-five years; embracing the surgical pathology and surgical technique for the mouth and associated cavities. It is the best text and reference book of its kind. As an encyclopedia of reference for the busy dentist, this book will fill a long felt want and should be in the library of every practitioner.

Text Book of Dental Pathology and Therapeutics, 5th edition, Henry H. Burchard, M. D., D. D. S. Rewritten by Otto E. Inglis, D. D. S., Lea and Febiger, Philadelphia.

The advance in recent years along lines of pathology have been fully met in this revision, while the section on therapeutics and pharmacology has been greatly enlarged.

The chapters upon bone infections, X-ray, secondary infections, etc., are worthy of careful study. This work, however, is open to the same criticism frequently heard of the former editions; that it is impossible to cover fully the subjects of pathology and therapeutics in the manner made necessary by advances in dental science, in an 800-page volume.

Pathology and Bacteriology for Dental Students. Guthrie McConnell, M. D. W. B. Saunders Company, Philadelphia and London.

Ethics and Jurisprudence for Dentists, by Edmund Noyes, D. D. S. Published by the author, Stewart Building, Chicago.

Notes on Dental Anatomy and Dental Histology, by T. W. Widdowson, L. D. S., Eng., third edition, revised.

Local Anesthesia in Dentistry. By Prof. Dr. Guido Fischer, Lea and Febiger, New York, 400 pages. Second edition revised.

Speaking of Operations, by Irvin S. Cobb. Published by Geo. H. Doran Company, New York. Dedicated to two classes of individuals, both of which will derive much pleasure and amusement by its perusal. They are "Those who have already been operated on and those who have not yet been operated on."

A Text Book Upon the Pathogenic Bacteria and Protozoa for Students of Medicine and Physicians, by Joseph McFarland, M. D., Philadelphia. Eighth edition. 807 pages, 323 illustrations. W. B. Saunders Company.

The Care of the Teeth, by Charles A. Brackett, D. M. D. 63

pages. The Harvard Press, Cambridge; one of the Harvard Health Talks; an excellent booklet for the laity.

Dorland's American Pocket Medical Dictionary, 9th edition. Edited by W. A. Newman Dorland, M. D., W. B. Saunders Company, Philadelphia and London.

Principles of Bacteriology, by A. C. Abbott, M. D., 650 pages. An entertaining and instructive treatise upon the subject, comprehensive enough to cover the minutest detail of laboratory technique. This work is well adapted to the needs of the dental profession today.

Alveolodental Pyorrhea, Charles C. Bass, M. D., and Foster M. Johns, M. D. W. B. Saunders Company, Philadelphia and London.

This book is apparently written in the effort to prove the author's contention that the endameba buccalis, by reason of the fact that it exists in nearly all pyorrhea pockets, must therefore be the etiological factor of pyorrhea.

Little attention is given to instrumentation and in view of the results obtained by dentists with local treatment alone, and since in the light of the fact that amebacides have not materially modified the clinical course of pyorrhea, this work has met with little commendation and much condemnation from the dental profession at large.

American Illustrated Medical Dictionary, edited by W. A. Newman Dorland, M. D. W. B. Saunders Company, Philadelphia and London.

The Simplex Handbook of Dental Materia Medica and Therapeutics, by Wesley Barrets, Ph. C., L. D. S., Eng., 340 pages. Published by Peter Reilly, Philadelphia.

A Text Book of Operative Dentistry, edited by C. N. Johnson, Chicago, third edition. P. Blakiston's Sons, Philadelphia.

The third edition of this well known text book is of the high standard of the previous editions and contains additional chapters upon "The Treatment of Impacted Lower Third Molars" and "The Application of the Roentgen Ray in Dentistry."

NEW JOURNAL.

Annali de Odontologia, Italy, edited by Dr. Angelo Chiavaro, Rome.

SCIENTIFIC ARTICLES.

The Innervation of Dentin, by Howard Mummery, D. Sc. M. R. C. S., L. D. S., Eng., in the March, 1916, *Dental Cosmos,* in which is shown that "There are true nerve fibres within the dentinal tubules and they are distributed to the dentin in great abundance. Probably the odontoblastic layer has nothing to do with sensation."

This part of his findings differs from Dr. Hopewell-Smith's article in the May, 1915, *Dental Cosmos,* in which the latter holds that the odontoblasts are end-organs for nerves. However, Dr. Mummery shows nicely stained specimens to support his theory and the preponderance of evidence seems to be on his side.

Other papers worthy of review, but forbidden by the already too great length of this report, are:

Germicidal Properties of Dental Cements, by Dr. M. R. Smirnow, in the November, 1915, *Dental Cosmos.*

The Chemical Constitution and Physico Chemical Properties of Dental Amalgams, by James W. McBain, M. A., Ph. D., and W. A. Knight, M. A., M. Sc., in the July, 1915, *Dental Cosmos.*

The Relation of the Diet to Dental Caries and Mouth Infection, by Dr. J. H. Kellog, in the September and October numbers of the *Dental Summary.*

The Problem of Dental Education in the Light of the Public Demand, by Dr. E. C. Kirk, in the April, 1916, DENTAL REVIEW.

The Evolution of Dentistry, by Dr. E. C. Kirk, in the May, 1915, DENTAL REVIEW.

Suggestions for Making the Dental Student a Better Student Dentist, by Dr. Arthur D. Black, in the June, 1915, DENTAL REVIEW.

What Shall We Do with Pulpless Teeth, by Dr. Thomas B. Hartzell in the February, 1916, DENTAL REVIEW.

REPORT OF THE COMMITTEE ON LEGISLATION.*

BY DR. C. R. E. KOCH, CHICAGO.

Your Committee on Legislation is gratified to report that the changes in the Dental Laws of Illinois which were under consideration by the General Assembly of this State, upon the initiative of this society at the last annual meeting were enacted by both branches of the Legislature, and that the act as thus amended went into effect July 1st, 1915, having received Governor Dunne's approval June 25.

Under this act now in force the admission for license to practice dentistry in this state is restricted to those who have been in legal dental practice in some other state or territory consecutively for a period of five years immediately prior to their application for admission to practice here, and to graduates in dentistry from reputable dental educational institutions.

It prescribes the manner of conducting the examinations of such applicants by the State Board of Dental Examiners, and constitutes the record of these examinations and the examination papers public documents, and directs that they be preserved for a period of not less than two years.

The authority of the Board to make reasonable rules to be observed as a standard of educational requirements by dental colleges or schools, as a basis for their recognition as reputable institutions is retained. By an amendment it is provided that the standard for admission of students to Dental Schools shall be a complete four years' high school course covering not less than 15 high school units—earned in an accredited secondary school. But in order not to exclude such worthy and competent persons from the privilege of entering the dental profession, as may for various causes have been deprived of the privilege of completing their secondary school education in the regular way, it is made the duty of the Superintendent of Public Instruction to appoint a committee of three examiners, who are empowered to examine such persons at stated periods and places, at least two of them being present, and if they find such candidates possessed of a knowledge equal to the 15 high school units, and so report to the Superintendent of Instruction, a certificate showing this fact is issued, which is by this act made of equal value for this purpose as the diploma or certificate of a secondary school. The records and examination papers are required to be preserved as public documents for not less than two years.

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*Read before the Illinois State Dental Society, May, 1916.

Power is given the Board to engage assistance in the investigation of complaints filed against violations of the law.

Administrative features have also been amended in order to make these correspond with the general plan of the state administrative method of efficiency instituted since 1909.

The sections providing for the establishment of reciprocity with other states and territories has been amended by eliminating the words "foreign countries." It was believed that arrangements for reciprocity with regard to recognition of dental licenses has no right to appear on state legislation, the treaty making power being vested in the General Government at Washington.

During last summer an unfortunate act of alleged misconduct by two members of the State Board gave to our State and our Dental Board much undesirable notoriety, and considerable unwarranted, hasty and inconsiderate condemnation.

It is to be said to the credit of our Chief Executive that he promptly corrected whatever may have been of improper official conduct by filling the places of the two men accused by new appointments, and we believe it is betraying no official secret to inform the Society that Governor Edward F. Dunne consulted the Society with reference to the professional fitness of the two new appointees, through your Legislative Committee, and that your committee gladly co-operated with the Governor in his efforts for efficiency in this field.

We desire to acknowledge the generous and more than official co-operation of Mr. Francis Blair, our distinguished Superintendent of Public Instruction. He promptly appointed the Committee on Preliminary Education by selecting as the members Mr. Swift, the chief clerk of his office and his personal assistant, a man long and favorably known among Illinois Educational progressives; Mr. Peter A. Downey, a man of ripe experience as an examiner, a studious pedagogue whose judgment has been broadened by many years in educational administrative training in Cook county schools, and Mr. Armstrong, the distinguished principal of the Englewood high school, Chicago, who has shaped its course and built its reputation during a quarter of a century.

Since its creation this Committee on Examination has held six examinations, one hundred and twenty-four candidates have presented themselves, of whom fifty-five have received full certificates. A number of the remainder will be given opportunity to present themselves again and if possible complete the requirement.

Your committee also wishes to acknowledge the efficient aid and counsel of Attorney General Lucey—given to the Board of Dental Examiners in the effort they are making to put a stop to persistent violations of the provisions of the Dental Act. With such powerful assistance seriously given, the authority to engage lay assistance to ferret out violations of the law as now given to the board, and the personal activity of our Dental Board, it is our belief a more active campaign, a campaign fuller of promise of success, to free the people of the state from the reckless exploitations of unauthorized and incompetent practitioners, is reasonably to be looked for.

Your committee commends the efforts of the board to the fullest and most loyal support of every member of this society.

The board being by our law endowed with full power to make reasonable rules, has already put itself on record by making it obligatory upon all Dental Schools to institute a four years dental course, beginning with the school year 1917-18, and may be relied on to make such other reasonable rules as the change to a four-year dental curriculum shall render needful or expedient.

Your committee does not suggest or recommend any change to be made in the dental law of Illinois in the immediate future.

In the proposed reorganization of the Army and Navy of the United States, the question of placing therein a corps of dental surgeons who shall be on a par in organization with the other staff corps of the Army has seriously engaged the attention of your committee, and it has endeavored to give effective aid to the proposition that such a corps, subject to the control of the Surgeon General of the Army and Navy respectively, is a military, sanitary and efficiency necessity. A very large number of sailors and soldiers are made ineffective for duty by reason of oral and dental maladies. Those who enter that service in the dental corps should have encouragement for a successful career, including rank, emoluments, promotion and retirement in old age.

We recommend that the members of this society use their personal efforts with their members of Congress—to make this proposition clear to them. A preparedness scheme at the present time that does not contemplate this organization of an effective dental corps cannot evolve maximum efficiency on the firing line.

All of which is respectfully submitted,

J. T. Search,
G. Walter Dittmar.
E. F. Hazell.
T. W. Brophy.
Charles R. E. Koch,
Chairman.

REPORT OF THE COMMITTEE ON NECROLOGY.*

BY DR. C. M. CAHILL, CHICAGO.

Mr. President; Members of the Illinois State Dental Society; Ladies and Gentlemen:

These records are in commemoration of our beloved fellow-craftsmen, whose terms of brief activity 'mongst us have closed. These are the records of their well spent lives.

Their examples teach us

"To feel the high, stern-featured beauty
Of plain devotedness to duty,
Steadfast and still, nor paid with mortal praise,
But finding amplest recompense
For life's ungarlanded expense
In work done squarely and unwasted days."

Abbott, Dr. Selah G. Dr. Selah G. Abbott was found dead in his office, in Rock Island, Illinois, on July 16th, 1915. The coroner's verdict was that "he came to his death by natural causes, as a result of a nervous break-down."

Dr. Abbott was approximately fifty-six years of age. He graduated from The Columbia Dental College in 1896. He was a member of the Rock Island Dental Society, The Illinois State Dental Society and The National Dental Association. He is survived by a family whose membership is to us unknown. For the above information, I am indebted to Dr. Fred Graflund of Moline.

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*Presented to The Illinois State Dental Society, May, 1916.

BLACK, GREENE VARDIMAN, D. D. S., M. D., Sc. D., LL. D.

"Know thou, O Stranger to the fame
Of this much lov'd, much honor'd name
(For none who knew him need be told)
A warmer heart, Death ne'er made cold."

Dr. Black was born in Scott county, Illinois, near Winchester, August 3rd, 1836. He was the son of William and Mary Black. At the age of ten his father and family removed to a recently acquired farm in Cass county, seven miles distant from Virginia. Here Dr. Black spent his boyhood, and here, too, he passed away August 31st, 1915, of acute pernicious anemia.

At the age of sixteen, Dr. Black went to his brother, Dr. T. G. Black of Clayton, Illinois, with whom he read medicine. At the age of twenty-one he began the study of dentistry with Dr. J. C. Speer of Mt. Sterling, Illinois. Afterward he practiced dentistry in Winchester, till 1862, when he enlisted in the Union army, 129th Illinois Volunteers. He held the rank of sergeant. As a result of an injury to his knee, he was, for six months, confined in a hospital at Louisville, being discharged for disability. In 1864 he opened an office in Jacksonville, where he remained in practice till his love for teaching induced him to come to Chicago.

In 1860 he married Jane L. Coughennower, who died in 1863, leaving a son, Dr. Carl E. Black. In 1865 he married Miss Elizabeth Akers Davenport, who survives him, with two sons and two daughters; Dr. Carl E. Black, of Jacksonville, Ill.; Miss Clara Black, of Chicago; Dr. Arthur D. Black, of Chicago, and Mrs. Mark Baldwin, of Duluth, Minnesota.

Dr. Black's degrees were: D. D. S., Missouri Dental College, 1877; M. D., Chicago Medical College, 1884; Sc. D., Illinois College, 1892; LL. D., Northwestern University, 1898.

He was Dean, and Professor of Operative Dentistry, Dental Pathology, and Bacteriology, Northwestern University Dental

School. He was a Past President of the National Dental Association; a Past President of The Illinois State Dental Society, and a member of the Chicago Dental Society. He was a member of the Masonic Lodge at Jacksonville. He was also a member of the Delta Sigma Delta Fraternity. He was chairman of section on "Etiology, Pathology and Bacteriology," World's Columbian Dental Congress.

The international Dental Federation, in 1910, voted him the Miller prize for "The most valuable contributions to dental science and literature."

Dr. Black was a scientist of rare ability. In the investigation of any subject, he was thorough and painstaking, and his notations were beyond question. His knowledge of chemistry and physics opened for him the mysteries of the earth; his knowledge of biology brought him intimate acquaintance with her flora and fauna; his knowledge of astronomy made him familiar with her heavenly bodies. With all these, he did enjoy familiar intercourse. He was as unselfish as he was thorough, giving the results of his investigations freely and willingly to the world.

On the highest pinnacle of fame in our profession, surrounded by a halo of imperishable glory, rests the name G. V. Black.

Though the voice of the great teacher is stilled, how fortunate, indeed, are we to possess his written works, a golden legacy, a priceless heritage. We may sit in our libraries and associate daily with him. We may repeat with Southey:

"My days among the dead are passed;
Around me I behold
Where'er the casual eye is cast,
The mighty minds of old.
My never-failing friends are they,
With whom I converse every day."

It has been said of him (Dr. Black) "His whole life was an illustration of the greatness of true goodness, and the goodness of true greatness."

In all the realm of dentistry, his equal has not appeared. Wherever the art is practiced, by reason of his writings and his innumerable inventions, humanity is being benefitted, as he would wish it, having labored for the common good of all mankind.

As I think of his last whispered words, "Trees, Flowers, Sky," I think of Whittier's "Autumn Walk,"

"What Greetings smile, what farewells wave
What loved ones enter and depart!
The good, the beautiful, the brave,
The Heaven-lent treasures of the heart!
The Oak leaves rustle, and the dry grass bends
Beneath the shadowy feet of lost or absent friends."

Earnest teacher! Gentle friend! On the shrine of our devotion, as a bright light, thou shalt ever shine, yea, "We will wear thee in our heart of hearts."

HOTHAN, JOHN C., D. D. S. Dr. John C. Hothan was born in Lake Co., Indiana, February 22nd, 1878, and passed away at his home in Crete, Illinois, November 12th, 1914. He was graduated from The Chicago College of Dental Surgery, in 1899. He immediately thereafter began practicing in Crete.

He was united in marriage with Miss Anna Brackman, of Crete, June 15th, 1904. She passed away March 5th, 1905.

On December 18th, 1912, he was united in marriage with Miss Hildegarde Brackman, of Chicago, who survives him.

He served a term as councilman, and was a charter member of the Commercial Club. He gave to Crete and her citizens all there was of his untiring energy and his friends are legion. In addition to his widow, he is survived by three brothers.

This should have been incorporated in the report of last year, but was received too late for publication.

For the above data, I am indebted to Dr. W. F. Schmeckebier, Chicago Heights, Illinois.

HALL, ALFRED WHIPPLE, D. D. S. Dr. A. W. Hall was born February 15th, 1873, at Detroit, Michigan. He entered the dental department of the University of Michigan at Ann Arbor in 1890 and graduated in 1894.

He was united in marriage with Maude Frances McRay in 1895. To this union was born a daughter, Dorothy. In 1895 he began the practice of dentistry in Quincy, Michigan. In 1896 he entered the practice in Chicago, continuing until the time of his death, July 18th, 1915. He specialized in extracting. He was a member of the Xi Psi Phi dental fraternity, the Chicago and the Illinois State Dental Societies.

He was also a member of Standard Lodge No. 873 A. F. & A. M., Chicago.

Dr. Hall is survived by his little daughter, his wife having preceded him into the great beyond some seven years ago.

JOYCE, FRANK P., D. D. S. All that I am able to learn concerning Dr. F. P. Joyce is that he received his degree from The Chicago College of Dental Surgery in 1904 and practiced dentistry in Chicago about twelve years. He was killed in his automobile the early part of this year.

BRYANT KERR, D. D. S. At Rockford, Illinois, on February 17th, 1916, Dr. Bryant Kerr, the quiet, dignified gentleman, the perfect type of the professional man and honored citizen passed from earth.

Dr. Kerr was born in Bigfoot, Dalworth county, Wisconsin, about sixty-eight years ago. The greater part of his life was spent in Rockford, Illinois. He began the study of dentistry in the office of Dr. C. A. Kitchen, and was graduated from The Pennsylvania College of Dental Surgery in 1880. Soon thereafter he engaged in the practice of dentistry in Rockford, continuing until the time of his death. Combining quiet modesty with unusual ability as an operator, he inspired the confidence of his patrons and secured a large practice.

He was a member of the state and local dental societies and contributed to their programs. One well acquainted with him said: "I knew him forty years. In his home he was affectionate, unselfish and considerate; the ideal husband. He never lost a friend.

His wife survives him.

For the above data I am indebted to the DENTAL REVIEW.

MYER, LINDLEY, D. D. S. After a five month's struggle, Dr. Lindley Myer, a prominent fraternity man and dentist, passed away in this city (Pontiac) Tuesday, August 31st, 1915. His death was due to valvular heart trouble, probably occasioned by a severe attack of inflamatory rheumatism some thirteen years previous. He was born, son of Joseph E. and Sadie E. Myer, county pioneers, on a farm in Eppards Point township, Nov. 29th, 1879. Receiving his fundamental education in the schools of that township. He was later (in 1900) graduated in the scientific and elocution courses of the Pontiac township high school.

Dr. Myer received the degree Doctor of Dental Surgery from The Northwestern University in 1905. He began the practice of dentistry in Pontiac that same year. He was married, June 4th, 1913 to Miss Virden Personett, of Pontiac. To this union was born a daughter, Lillian.

He has been, since 1893, a member of the Baptist church. Was a member of Pontiac Lodge No. 294 A. F. & A. M., Bloomington Lodge of Perfection, Ancient and Accepted Scottish Rite Masons; The Independent Order of Odd Fellows; The Red Men, of which he was Chief Recorder; The Yeomen of America, of which he was secretary, and The Tribe of Ben Hur, of which he was scribe.

Funeral services were in charge of the Masonic Lodge, and interment in the Payne cemetery, near Chenoa. In addition to his wife and daughter, Dr. Myer is survived by a mother and two sisters.

I am indebted to his beloved mother and the Pontiac papers for the above data.

Montgomery, Thomas Albert, D. D. S. Dr. T. A. Montgomery was born in Carrollton, Missouri, July 7th, 1879. He received his early education in his home town. At the age of seventeen, he removed to the state of Texas, where he remained ten years. He attended the Western Dental College two years, finishing his course at The Chicago College of Dental Surgery in 1907.

He was united in marriage with Miss Mabel C. Platt, of Chicago, in 1907. He was a member of the Xi Psi Phi Dental Fraternity, the Chicago Dental and the Illinois State Dental Societies.

From time of his graduation, he practiced continuously in Chicago until last August, when he was taken ill with pernicious anemia and passed away December 25th, 1915. His wife survives him.

For the above data I am indebted to Dr. R. W. Becker.

Dr. Laird W. Nevius was born in Knox county, Ohio, in 1845 and died in Minneapolis, Minnesota, August 1st, 1915. His death was the result of an automobile accident.

At the age of seventeen, he enlisted in the Ohio Heavy Artillery. April 1st, 1864, he was commissioned Corporal and

Sergeant on August 9th. August 23rd, 1865, he was commissioned Quarter Master Sergeant, and honorably discharged.

Dr. Nevius received his certificate to practice from the Ohio State Dental Society, June 5th, 1872, and from the Illinois State Board of Dental Examiners, August 11th, 1890. He was a member of the Xi Psi Phi Dental Fraternity, The Illinois State Dental Society, The Knights of Pythias, Lodge No. 137, Toledo, Ohio, and the Royal Arcanum.

In New York City, he was associated in practice with Dr. Colton.

For more than twenty years, he practiced in the city of Chicago, a part of which time his son, who continues the practice, was associated with him.

He was the author of "The Discovery of Modern Anaesthesia"; the inventor of the first automatic gasometer, head light, inhaler, forceps and other instruments.

For the above data I am indebted to his son.

SHARP, B. B., D. D. S. Dr. Benjamin Baxter Sharp, son of William and Nancy Sharp, was born at Abingdon, Washington county, Virginia, December 22nd, 1864. Died at Mendota, Illinois, March 14th, 1916, aged fifty-one years, two months and twenty-two days. At the age of four years his father died, leaving the widow, his mother, with a large family, of which he was the youngest member. For fifteeen years he remained with her on the farm. He then joined his brothers in Illinois. Six of them had become dentists and located in the West. Portions of the next nine years he spent in studying dentistry in the offices of his brothers. He passed the state examination and was licensed to practice dentistry. Later he took a course in The Chicago College of Dental Surgery, graduating in the class of 1898. After graduation he purchased the practice of his brother, Dr. A. F. Sharp, at Mendota, where he continued practicing up to the time of his death.

On August 10th, 1899, Dr. Sharp and Miss Stella Reid were united in marriage. To them were born three sons, Baxter Reid, Francis Wayne, and LeRoy Harold.

Dr. Sharp won his way to success by conscientious, diligent application to his work; had high ideals for his personal life, his home life and for the community. Interment at Restland cemetery.

In addition to his wife and three sons, Dr. Sharp is survived by five brothers and three sisters.

I am indebted for the above to Dr. F. J. Patterson of Mendota, and Mendota papers.

TULLER, ROLLIN BREED, D. D. S. Dr. Tuller was born in Cincinnatus, New York, June 29th, 1845. Died at his home, Chicago, Illinois, March 20th, 1916. During the war of the Rebellion, for nearly three years, he served as principal musician of the 136th Regiment, New York Volunteer Infantry. He attended Pennsylvania Dental College two years. He practiced dentistry in Rouen, France, during 1883 and 1884. Graduated from the Chicago College of Dental Surgery with the class of 1890. For ten years he served as a member of the faculty. He was a member of the National Dental Association; the Illinois State Dental Society; the Chicago-Odontographic Society, of which he was president in 1893; The Delta Sigma Delta Fraternity, of which, for two successive years he served as Supreme Grand Master. He was formerly editor of the American Dental Journal, and for many years associate editor of The Bur. He was a member of St. Cecilia Lodge No. 865 A. F. & A. M., and Columbia Post of the G. A. R., who conducted the burial services in Rosehill cemetery. Dr. Tuller leaves a widow and two sons, Dr. Charles S. Tuller of New Orleans, and Rollin M. Tuller.

Having been a class-mate of Dr. Tuller's son, Charles, early in my college career, it was my good fortune to gain entree to their home. Here his kind, beneficent nature was best portrayed. It was here that I learned of his deep interest in young people, and it was here that I learned of the innate modesty of the man. Of this I can cite no better example than a stanza from one of his poems, entitled

"Jostle, Jostle, Jostle."

"The nobler man is he who tries to oft forget himself,
Whose manliness can not be bought by glittering, paltry pelf;
Whose willing hands are oft put forth to pull a brother through,
Who keeps in mind the Golden Rule, and gives each one his due.

Jostle, jostle, jostle; 'tis the way we go through life;
Jostle, jostle, jostle; with some friction, with some strife;

But let fairness mark each action, in honor prove well bred,
And never push another back to put one's self ahead."

In addressing young men, and I have heard him many times, through his jovial humor there was always a deep and underlying serious vein carrying much good food for reflection. To my mind, his poem, "The Mantle of Manhood," was indicative of his very best thought, and a part of which is:

"Capricious Dame Fashion, exacting, severe,
Lays her claims on us all, quite enslaving;
For it humbles the heart if the coat we must wear
Does not fully requite her stern craving.
Yet a mantle is ours of a texture so fine
That her frown will be cast on it never,
'Tis our mantle of manhood, a garment divine,
Let us keep it about us forever.

Most enduring and strong is the garment if we
But protect it from contact degrading;
And the more it is worn, the better 'twill be,
No danger indeed of its fading.
'Tis a pattern of old, but in fashion alway;
There are none who in truth can deny it,
To honor's true court, there's no better entree
And the treasure of kings can not buy it."

WHALEY, DR. J. J. Although your committee has spent much time and earnest endeavor to secure data concerning Dr. Whaley, long associated with Dr. Crouse, they are unable to do more than inform you that this year he, too, passed into the Great Beyond.

Though around their last resting place, the winds through leafy trees moan and sigh their requiem of grief, the very air about their graves must seem hushed to claim this, the holy tribute of our last words of love.

Standing on the verge of this strange land, between the now and the eternity, the thoughts of our departed brethren, like gentle zephyrs stealing through the labyrinth of memory, awaken in our hearts anew their noble actions, deeds and words. All these impelling us to feel that the world's most wonderful development is but the working of that Spirit of Immortality that compels the soul in firm belief to look from Nature to Nature's God, and realize that

"Life is but an errand to the magic morn
Forever on the brink of being born;
The bright to-morrow, cradled in no cloud,
Beyond the latter pain, beyond the shroud."

And these immortal souls, in passing, have left their smile of hope; they saw the golden sunrise of a sweeter life, and left its joy imprinted on their way:

"And I can not say, and I will not say,
That they are dead, they are just away.
With a cheery smile and a wave of the hand,
They have wandered into an unknown land,
And left us dreaming, how very fair
It needs must be, since they are there.
Think of them faring on, as dear
In the love of There, as the love of Here.
Think of them still as the same, I say
They are not dead, they are just away."

Respectfully submitted,
C. M. Cahill, Chairman.
W. A. Alexander,
E. B. Knights,
The Committee.

COPPER CEMENT.

BY FRANCIS EATON BURNETT, D. D. S., CHICAGO, ILLINOIS.

Of the more valuable agents used in dentistry less is known of copper cement than any other. There are two reasons why this is deplorable, first because the physical properties of no other agent are so self-evident and easily understood, and second, because no other agent has such a valuable mission to perform and is so unwittingly neglected. This latter hints that both patient and operator are made to sacrifice alike, if copper cement be indicated and not used.

Probably no other single agent used in dentistry can accomplish as many different things, in so satisfactory, positive and definite a manner. The operations it is made to perform are dependable, exact results are gotten, which can be measured and contemplated.

AN EMBALMER OF DECAY.

The copper cement, unlike zinc oxid cement, not only fills a space, but it fills that space and transmits a medicinal and embalming property to the tooth substance. It reaches down into the tooth structure and extracts from the half decayed enamel rods and dentin, the serum, and returns instead a dark coloring matter, the copper salts. The older men of the profession have observed a similar metallic stain as coming from copper amalgam fillings. In the manner of its action, the copper cement not only effects its purpose as a cement, but the correcting influence of the copper salts will keep healthy a pulp, which surely would have died near a zinc cement. For the tooth that is considered beyond saving, copper cement is both treatment and filling combined. Decay does not repeat or advance where the copper salts have penetrated.

ADHESIVENESS.

While both zinc and copper cements have adhesive properties in varying degrees, the copper is by far the more adhesive. It lingers securely fastened to a flat surface—or at least does not require cavity retention. The fineness of the copper oxid granule perhaps accounts for this unusual adhesiveness. After repeated failures with a zinc cement, to securely attach a crown or bridge, success in the first instance will be attained where copper cement is used.

HARDEST AND DENSEST CEMENT.

The red oxid (copper) is baked until it turns black, care being taken that it does not suddenly return to the metallic state. Its nearness to that state as compared with the zinc oxid has to do with the hard nature of a copper cement, for indeed, it is the hardest and densest of all cements. To carve it is so nearly impossible, that provision must be made to shape and contour the mass while it is yet plastic. This hints at what may be accomplished in preparing with copper cement a desirable abutment for crowning.

STOPPING DECAY AND PAIN.

The copper cement is indicated in the sensitive buccal cavities, as it not only fills the tooth, but the copper salts will penetrate the tooth tubules, stopping both decay and pain.

These buccal cavities are selected for description, because the approach to them is difficult, and their extreme sensitive nature sometimes precludes the opportunity of any other procedure. A similar condition prevails in the youth's mouth, causing this valuable agent to find its first demand in the deciduous teeth.

The opportunity to accomplish much with a child is sometimes remote, but the poorest effort promises results if done with copper cement. The preserving influence of the copper lingers about the tooth substance, even if the filling is defective or does not stay in place.

MAINTAINS LIFE OF PULP.

It not infrequently happens that decay is in close approach to the horn of a pulp, when the death of that pulp would be followed by infection. If tooth be filled with copper cement the salts will penetrate alone the line of decalcified dentin, and effectually sterilize the part, with the result that the pulp will continue a peaceful existence.

SOME EXTREME METHODS.

In some very badly decayed first permanent molars, after only superficially removing the decay, a regulating or any other band may be hastily attached to tooth, and the crown surface liberally filled with a creamy mix of copper cement. The effect will be to reduce the sensitiveness, sterilize the part and tide the tooth over until more thorough work can be accomplished. Decay will not return or advance from the copper cement filling. The band may be removed or not and the tooth dismissed for years. At a later date the gums will have receded, the stump made healthy, the apex become normally constricted and permanent work invited. This description was intended to be crude and seem far fetched, that it might more nearly picture the method adopted to allow this cement to bring about a satisfactory condition. In truth, however, the description is taken from a case in practice, where decay ravaged on account of early mal-nutrition, wherein the four first permanent molars were saved and today, 16 years later, that patient is in adult life with a full complement of teeth.

ABUTMENTS FOR CROWNING.

For building a foundation to be enclosed in crowns or bridge abutments, copper cement has no equal. It medicates while it supports, and it sticks to everything, including flat surfaces. On a very much broken down root adjust temporarily a band made of any flat material, (grease the inside of band) fill the root canal with copper cement, introduce pin in root, and shape excess cement to the contour of the root and the band. When cement is set remove band and root is ready to crown.

In this particular instance if root was a much decayed one, and if there was such a thing as an opening toward the apex, meaning a root not properly filled, the stain from the copper cement would follow along that opening and effectually sterilize it. The point to be illustrated is that these salts will go anywhere there is moisture or decayed dentin on which to travel, and their migration is only limited by the approach to healthy tissue.

RESTORING SPLIT ROOTS OR TEETH.

For split roots or teeth bring the fractured parts together and use band as before (if a pin is to be used place it that it will enter canal) press the cement that it will enter the fracture and fill all the space to the peridental membrane. Remove the band when cement is set and fractured parts will be held to place by adhesion of cement, the diseased parts medicated and tooth ready for crowning.

RAISING THE TONE OF TEETH.

Teeth that are soft and odorous are favorably cared for with copper cement, as their integrity is raised to a point desirable for crowning. Splints for fractured jaws, also regulating appliances are sometimes set with copper cement because of its adhesive properties. Indeed it was while using it for splints that it was discovered the lacerated tissue would recover first, where in contact with the copper cement.

PUNCTURE OF ROOT CANAL.

The accidental puncture of the root canal absolutely indicates copper cement as a means of closing the aperture, as it is at once a germicide and a soothing agent to the peridental membrane, also it is the one of all agents that will lie sealed in at such a place.

RESTORING THE BIFURCATION.

If the bifurcation of a tooth be either gone or nearly so, it is desirably restored with copper cement, as any or all the properties needful for success are contained in this valuable material.

THE WORST TEETH SAVED.

As a general rule it may be said that the more forlorn the condition of a tooth, the more the copper cement is indicated, due allowance being made for the color of the cement.

The following interesting case in practice illustrates some of the properties of copper cement.

A patient exhibited a loose pin crown on upper central root. Canal very much enlarged with a flaring opening. In about the middle third of root, posteriorly, was a large opening through which the peridental membrane was seen to pulsate. All efforts to seal or close were of no avail, because of the size of the opening and the hemorrhage and because that which was accomplished was so easily dislodged. While attempts were in progress the infection extended around the root and erupted on the labial surface of gum. As a last resort the crown was cemented to place without regard to further treatment, no provision being made to close the opening—and no treatment other than a styptic to stop the hemorrhage.

The result was, the copper cement securely fixed crown in place, it closed the hole in root, sterilized the part, pus ceased and sinus closed.

The copper cement to be desired should be of pure copper oxid, should set neither too quickly nor too slowly and should never develop heat while hardening. A copper cement is used in a faulty manner if before it sets it should so wash that a heavy black curd would cover the tongue and mucous membrane. It has been reported that patients have been made to vomit from such a condition.

Since there are different kinds of cement labeled "copper cement" it is fair to state that the properties this paper would describe, come from a cement which is made of pure copper.

It must not be expected that the same properties would prevail from a package, the contents of which is largely or approximately three-quarters zinc oxid. Each kind may have their use. The one to which reference is here made is a true copper cement, meaning all copper, and is quite as easily mixed and manipulated as any zinc cement.

While the copper cement is of modern production, the curative properties of the sulphate of copper were referred to 2,000 years ago. It was used to heal ulcers.

Our Materia Medica of sixty years ago mentions the curative effect of the copper salts for ulcers and infection, which is today one of the strongest arguments for the phosphate of copper.

As a review, much may be said of this interesting product so little understood. It is the hardest plastic known, the most adhesive, and the only cement which will mummify or embalm decayed dentin, medicate a putrescent tract—either of which conditions are made inert as far as they exist in the tooth substance.

Moreover, it is the only plastic of a cement nature that is agreeable in contact with the peridental membrane or alveolar process; this because of its hard vitreous nature and the medicinal property given off by the copper salts. Observations of this condition have been so frequent as to remove any doubt.

For building up old roots, restoring the periphery of a root, for cementing pins in roots, it is indicated on account of its medicinal property, together with the fact that it is the most adhesive and hardest plastic known. No foundation could be more desired than the one with such a defense.

Restoring the bifurcation, closing accidental punctures of the root canals and knitting together fractured teeth are indicated, promising results for reasons as described. This product is neither new nor old—and yet thousands of teeth and pulps live today to verify its usefulness.

But after having appreciated all the virtues of this valuable agent, is it not ungrateful to say "That it is black and discolors the teeth?"

This paper was written years ago, and later observations only confirm the foregoing. However, there is a pertinent question that comes up at this later date, which is this: Why is it that adjacent to copper cement or copper amalgam fillings—there is a subsidence of inflammatory condition? What is this selective effect and from whence does it come? It presents a question, the answer of which will answer much as to what causes inflammation of the peridental and mucous membranes.

PROCEEDINGS OF SOCIETIES.

THE ASSOCIATED DENTAL FACULTIES OF CHICAGO.

(Continued from the July Number.)

DISCUSSION OF THE PAPER BY DR. TRUMAN W. BROPHY ON "DENTAL EDUCATION."

Miss Florence King:

I am honored indeed in being invited to speak to you this evening, for I had intended to come only as an innocent bystander and listen to what you would have to say.

I have been very much interested in what each of the speakers has said. My superior officer has so very clearly stated to you the things in which he is interested in the school, and it seems that the high schools of the state are not meeting the requirements that the young men and young women need when they enter the professions.

I agree with what Mr. Shoop has said. This is indeed the day of specialization, and if I had specialized in your line of work instead of in the law, I might be able to present an idea that you could take away with you, but, it seems to me, from top to bottom, every fact has already been presented. One thing that occurred to me was the question, why study astronomy or agriculture? May I point out to you why it is an advantage, at least, to have an interest in agriculture? This is the first time I have ever had the pleasure of meeting your monored President, Dr. Brophy. Long before I knew of him, I knew of his interest in agriculture, and if I am not mistaken, he is the Dr. Brophy who has the Ingleside Farm. Do you see the connection between agriculture and the dental profession? Ingleside is one of the show places out on the edge of the city, and I live close to his farm, so I have had occasion many times to see manifestations of interest in agriculture before I knew what he was doing in the dental profession.

With reference to the remarks of Mr. Downey, he told you of the limitations that people who were entering the professions often have to deal with. He mentioned a number of them, all of which are true, and yet I think he omitted one. We all speak in terms of our own experience, and the Superintendent of Schools said something like this in quoting from Emerson, that "Man was only one-half of himself, and the other half was expression." He spoke about limitations. Some people are limited by reason of a lack of proper education; others are limited by reason of the condition of their mental faculties. Still others have limitation by reason of domestic infelicity, while others were limited because their personalities were not pleasing, and so forth, but he did not refer to the limitation that is placed upon a woman who enters a profession, and being thus limited myself I know exactly what that means, and yet we all appreciate today the advantages that women in the professions have over what they did when I started something like twenty years ago. We have made considerable progress in that time, but there are limitations yet, and while no one is willing to admit, there are prejudices against women in the professions and these prejudices do exist. I would have been happy to have seen one or two more women here tonight, and particularly those connected with the medical schools and with dental schools. I hardly see any good reason why they should not have the same requirements exacted of them in all the work they do the same as men. Women should have the same qualifications before they enter the professional schools, and being interested in the business women in Chicago and the professional women as I am, I have come in contact with the products of these schools, and I must say they are doing good work here, and it cannot be otherwise than possible that some of these women are amply qualified to do the work that needs to be done in some of the dental schools. I certainly would like to see any of the schools give them that opportunity. Perhaps you have not thought about it and they do not come to you. They will not come to you because they feel there are limitations placed upon them. Their limitations are as hard and I venture to say perhaps harder than any of the limitations that you gentlemen have met, and while you have all that they have in the way of educational advantages, you do not have the vast prejudice to contend with that women have when they enter the professions. It is hard for woman to overcome that in the medical or dental profession as it is in the legal profession. In your profession, as in the medical profession, women may enter the field and depend largely upon women for patronage and thus may work up a good practice, but it is not so in the legal profession or in the branch in which I have specialized, namely, inventions, corporations, etc. Women are only slightely interested in that branch of the profession. I know whereof I speak, and that is a decided limitation, and one that I wish all you men would think of a little bit, and where you find a woman who meets the requirements give her a chance. I would never ask you to give her any of the advantages that should not be given to men simply because she is a woman. She should measure up to the same preliminary and professional requirements as the men students. But do give her a chance to make some progress in her profession. Find a place for her in your schools and it will open the way for many others, and in this twentieth century we are indeed living in a new age, as Mr. Shoop said, and part of the prejudice can be overcome when women are given the same opportunity in the professions that men are. We as women are in the professional and industrial world not so much from choice, believe me, as from necessity. Necessity should know no law in this any more than in anything else, and if you will do that much for my sex, I shall be happy to see the first step in that direction come from this organization. I thank you. (Applause.)

Dr. Thomas L. Gilmer:

After the brilliant speech by the talented young lawyer who has just taken her seat, I hardly feel it is possible for me to say anything which will attract your attention. There is no one perhaps who is more qualified to speak of the history of dentistry or of dental education than our friend Dr. Brophy, the president of our association. He is probably one of the oldest educators we have in the country at this time, and he knows the beginning of dental education just as well as he knows the present. Anything that Dr. Brophy may present to us is certainly worthy of consideration, and while we may not wholly agree with him in everything he has said, we must, I say, give consideration to his words. That there is something wrong in the education of the young people who come to our schools to be made dentists there can be no doubt. Just what this is I am unable to say. It seems to me, that there is something wrong in the attitude of the young people who come to us. I do not think that we get as a whole as good a class of men as the medical profession or the legal profession get as students. Just why that is it is difficult to say.

Now, what shall we do with the extra year—the fourth year? That is a question which is uppermost in the minds of those who have been teaching dentistry for any length of time. I feel that as Dr. Koch has expressed himself, we should do something in the way of devoting time in educating young men for our profession. Part, at least, of the first year, should be devoted to that one thing. How that can best be done each school must decide for itself. There are two things we wish to do. One is to get men into the proper attitude for the study of a profession, and if we can place these young men for one year in contact with the young men and young women who are studying in the universities, it seems to me, we will have done a great deal. They will have gotten the university spirit, which is the spirit of learning. This would broaden the men and they would be much better qualified to take unto themselves the education which fits them for a profession. If we simply devote the time that has been spent in the past, that is, if we do not broaden out our curriculum to a certain extent, it seems to me, beyond what it has been in the three year course, that is, to put all the three years work into the four years, it will not be sufficient.

The subject is so broad that my thoughts are not sufficiently crystallized at the present time to discuss this subject further.

Dr. F. B. Moorehead:

I do not think there can be any argument as to the question of what our composite purpose is. If we could sum up the attitude of mind of every individual in this room it might be stated in this way: We have just one object, and that is to prepare these young people as best we may for the practice of dentistry.

Now, there are no hard and fast rules in the best kind of educational development. We might illustrate that in this way: Given an individual who is himself a teacher, he can take one type of man, he can adopt one method, and by that method with his own personality induct the young man or young woman into a higher sphere of thought and activity and usefulness. Another individual may take the same student or the analogous, and by a different method and perhaps by different subject matter produce as fine a student. We cannot be limited to rote in education. The crux of the whole situation is, what shall be the content of this four year curriculum? And you can look at it from two angles, depending upon your own academic viewpoint. You can say that the best type of preparation for these young men is to give them another year of the same sort of training that we have had in the three years, not particularly increasing the quality or introducing new subject matter, but giving them a better preparation in the things we have been teaching heretofore. You can take the other and say we are going to give this young man a better conception of what he ought to be. I view it from this standpoint: Take two students, one who can be pinned down to facts and to technic, if you please, and in the other you can instill into him a principle, and both have finished their course at the end of four years. One is capable of original thought, creative thought, of perspective, of vision while the other is limited to facts. I do not believe there is any argument as to which individual is going to make his contribution to society. I do not think there is any argument at all about that, and the question is of putting into the first year of the four year course some of the basic things. English has been taken up and has been referred to in this discussion.

During a visit to the University of Minnesota I spent some little time among the classes in talking to the teachers and President Vincent. They have in the first year of the four year course a course in rhetoric, and this course in rhetoric is sympathetic in its attitude toward the life of the student. In the class in rhetoric they do something like this: A student has to prepare and deliver a five or ten minute thesis on a subject which is definitely and specifically related to his work. For instance, one student takes ten minutes on the human tongue and its function. Now that boy is studying anatomy specifically. He is, at the same time, learning to express himself and to put into the right kind of language his thoughts. He is not graded on his anatomy, but graded on his English. The next student prepares a ten minute thesis on oral hygiene, and so on. I think that sort of course in English is a magnificent thing. It is a definite contributing type of education.

As to the course in mechanical drawing, some objection has been raised to that, and in the University of Minnesota they do this: All of the objects which are taken as types in the mechanical drawing class are from the dental laboratory. Students take flasks for vulcanizing. Plates are vulcanized. They take the ring for casting inlays. Those are the things which they draw; they become familiar with the apparatus they are going to use in practical work, and at the same time they are learning certain basic facts underlying the question of mensuration. They learn to use the Boley gauge; they learn to use the metric system as a thing applying to their work, and the meter and centimeter are not foreign to these students. They know what it means to deal with the angles of cavities which they see in operative dentistry, but, at the same time, they are learning the underlying principles of mechanical drawing. That is directly dental. It has this advantage: It has perspective and a vision, and is not limited to just what is this? I think that amount of training may be granted in school in perfect safety and the ultimate problem, I believe, will be a satisfactory one. At least, those universities which believe in that sort of thing are testing it out, and in the next five years or six years it will be a simple matter to determine which is the better system.

I want to say one word about Dr. Brophy. Dr. Gilmer said we may well afford to pay close attention to his utterances, and that is exactly true. I doubt whether we have in this country any other single individual who has labored better for dentistry than Truman W. Brophy. I do not believe in the limitations which he prescribed for the four year course. He may be entirely right, and I may be entirely wrong, and we hope he will be gracious enough and big enough, as I know he is, to give us a little latitude, and perhaps if he will, we will come back and say you were right. That is all we ask. Give us a chance to see whether or not we can put some fundamental thing in the first four year course that will go toward making a better type of professional man, and what we must do in this whole proposition is to get a better type.

Dr. Don M. Gallie:

I have been much pleased with the remarks of those who have discussed Dr. Brophy's paper. While Mr. Downey and Mr. Shoop were speaking of optional studies and the latitude given to students in their high school work, I was impressed with this thought, that too many of our boys in high school are allowed to go through simply to say that Willie and Mary have been through high school and have taken certain courses in college without any attention being paid to their life work so far as the practical application of their studies is concerned. It seems to me, that the parents of every boy in high school who reaches the second or sophomore year or the beginning of the junior year should have some idea of what that boy is going to do for a livelihood, so that the subjects or studies he takes up in high school have a practical application to the professional school, whether it be engineering, agriculture or any other profession. If we follow out that idea it would apparently solve this great question of proper education.

In the consideration of this subject we must necessarily go back to the parents and place the blame there, and I believe that if parents had a better understanding of what boys require or have in mind what they should study in their high school course to follow up their life work, which would be beneficial, it would go a long way toward solving this problem.

A few years ago a number of high schools started this innovation: Every Wednesday afternoon they had different representatives from the different professions, who lectured to the students of high schools, devoting one afternoon of each week to such lectures, which proved of great interest and benefit to many of the students. In that lecture course there were junior and senior students, and I know of a number of high school principals who said it was an excellent idea and productive of much good because it aroused interest in the minds of students and gave them thought and a broader vision and directed them into a channel so that afterwards they were able to work to much better advantage.

This is a tremendous subject and one that must be viewed from many different angles. It is not simply a question of the school system which has its difficulties, but there is a lack of system, and I think the responsibility is up to us to in some way work out this problem so that it will be of greater advantage and benefit to young men and young women starting in the professions or in any other calling of life.

DR. WILLIAM L. COPELAND:

Mr. President and Gentlemen: I did not come here prepared to say anything on this subject. I have enjoyed the evening, and I think I can grasp the difficulties which we are all laboring under, and I believe I am broad enough to see and believe that two men or two schools may take this thing from a different standpoint and adopt a different course and still be perfectly sincere in their ideas towards reaching the end which we are all working for. I think the subject should be given consideration by each and every one, more certainly than I have done, before attempting to take any definite stand.

Dr. Arthur D. Black:

I have two things in mind in connection with the subject under consideration, one in relation to teaching in the high schools, and the other in relation to the future teaching in dental schools. I think the time is fast approaching when every professional school of good standing will not only prescribe the equivalent of a high school education, but will include in that prescription a number of the more important high school subjects as obligatory, which means that it will not be many years before high school teachers generally and parents generally will come to appreciate the fact that if a boy or girl expects to go into any professional career, there will be certain things they must study in the high school course. This requirement on the part of the professional school will do much toward eliminating the optionals in the high school courses. The professional school will thus demand and bring about a change in the high school courses. We see the tendency to meet our requirements in what Superintendent Shoop has said. They are alert to the situation in preparing students for their future work.

As to the four-year dental course, only about eighteen years have elapsed since the dental school course consisted of two years with nothing required as to preliminary education. In eighteen years we have come to a four-year dental course with the preliminary requirement of the full high school course. We ought to be well satisfied with the progress we have made.

Within a few years we should be teaching dentistry on the same basis as medicine. Men should have the same two years in college as a preliminary to dental teaching that the medical student has today preliminary to his actual medical teaching. I think we may look beyond to the time when the other specialties are going to have special teaching beyond their own medical course. A man has to have it today to practice a specialty with any degree of success. For instance, they do not teach enough ophthalmology nor rhinology in a medical college to properly equip men to practice those specialties. I believe the time will come when there will be a basic medical course for all who are to practice in any department of medicine, including dentistry, to be followed by special courses in special schools devoted to the various specialties of medicine. Dental schools should so plan that they will be ready at the earliest practicable time to fit themselves into such a scheme. When we do that we will really be an integral part of the medical profession.

Between now and then, what do we need? We need what Dr. Brophy suggested in his paper—more dental teaching. We also need, as Dr. Moorehead and Dr. Gilmer have suggested tonight, more of preliminary education. A year of college should precede the dental teaching; two years of college would be better. We need both of these, but we cannot get them both at once. We are facing a problem here in which we cannot possibly give the student all we know he ought to have and each school must therefore pick out that which under its surrounding conditions it can give to the best advantage. That is the reason we need some latitude; that is the reason several of the associations have adopted resolutions which prescribe that forty-two hundred hours of the course shall be devoted to strictly dental subjects and the other six hundred hours to ancillary subjects if desired. Our conditions are not the same; our teaching capacities are not the same, but although we may be divergent at the start on this proposition, as each year goes by we will come closer together. Within a few years I believe we will have a year of college as an entrance requirement for a four-year dental course. We will then have but one more step to take to put our schools on the same plane as the best medical schools.

Dr. Edmund Noyes:

I do not believe there is much that I can add to what has been said, and I have not fully crystallized my ideas in my mind as to just exactly what should be done with the additional year when we come to the four year course. It seems to me, that it would be for the most part unfortunate if we simply spread out, spin out just exactly the things we are teaching now in the three years course. We ought to have more in the four year course, not merely better teaching in the things we are teaching, but teaching something in addition at least. The temptation to my mind is very great indeed to make that additional year help the young man, especially in regard to the English which has been spoken of, and it strikes me the plan which Dr. Moorehead described as being pursued in

Minnesota is an excellent one to that end. I am sure all of us have been mortified and disturbed at the character of the English that we get in examination papers.

There is another thing related to this, it seems to me, of great value if it can be done, and that is making the additional year more associative, allowing the young man to become more closely related with higher education, more closely with the college and university spirit; in other words, make him a better professional gentleman by association with educated people. It is very desirable also that we should approach just as fast as we can the standards of the medical profession because the relations between the dental profession and the medical profession must inevitably in the future be far closer that it has been necessary for them to be in the past, and we must be fit for it. The developments within a very few years have brought dental and medical questions into a dependence upon each other in such a way that neither the dentist nor the physician can do his work and fulfill his duty to his patients unless they work closer together in a great many instances, and the more nearly we can make our standards of scholarship, of equipment, or requirement, correspond with those of the medical profession, the better it will be for us and the better it will be for the communities we serve.

There has been the suggestion, at least, of a considerable diversity of plan as to what will be done by the different schools with this optional year. It seems to me, that liberty in this respect is very desirable. It is a new departure, and just how it can be worked out to the best advantage for the profession and the public that we serve is not absolutely apparent to any one; but if one school puts its students through a college or a university for a preliminary year; if another school simply gives greatly increased thoroughness in the teaching that has been given in the third year course and nothing more, and if another school does the same teaching in its own institution in English, business principles, and the other subjects that are necessary and desirable, after a few years of practical experiment in this way by different schools there will be a gradual consensus of opinion as to which plan is the best and we shall get a better plan than if we all do the same thing first.

Dr. Charles E. Jones:

I want to speak just a minute regarding the first defect we see in the new students in our school. The first thing that we invariably see in a boy is a defect to express himself in correct English. Invariably when we find a man defective in his preliminary education he becomes a special charge to us, and particularly to those who have intimate relations with students. We have to watch and guard that fellow throughout his entire professional career, and I do not want you to understand that the Chicago College of Dental Surgery has a division of opinion in this particular. We are simply expressing in this instance our private ideas about a thing that we view from two standpoints, and if the Dean believes that English is not a requisite training for a man after we receive him, some of us still believe it is a necessary thing, and we believe he will capitulate to our endeavors eventually because he will surely see the light as he has not seen it before. We want such students not only to build plates and bridges, but we want our men to be on a par with every professional man that goes out into life's endeavor. We want no disparity between our product and the product of the legal or medical school. If the high schools are deficient or inadequate in the training they give their men in the vernacular, then we must make up that deficiency. There is nothing else for us to do. The boy must be able to express the ideas that we convey to him and the only way to do that is through the English language.

Dr. C. N. Johnson:

I have been very much entertained this evening by the remarks made by the superintendent of our schools and by Professor Tobias. I have also been very much gratified at the remarks of the lady representing the legal profession. It is an illustration of the fact that we can get the best information and the greatest benefit by conferences such as we are having. We have not met with the educators as much as we should. Possibly it is more our fault than theirs, but I want to express my profoundest astonishment at some of the revelations made here tonight. In saying that I must acknowledge that I have not until tonight known of the full inadequacy of our high school system.

I was brought up under an environment, Mr. Chairman, in which I was compelled as a student to study certain things, and to be told tonight that practically all the high school studies are optional with the students is the most discouraging thing I ever listened to, and my astonishment is that we have students prepared as well as they are. I feel that much of the energy I have used in trying to teach dental students all these years has been largely wasted on a lot of timber that were never properly prepared, in the first place, to enter a professional school. I feel that to a certain extent we have been imposed upon. It is not the fault of the educators; it is partially our fault because we have not applied to educators before this and requested them to consider our point of view and to present to us men of broader caliber and women of broader caliber to enable them to take on professional studies.

It seems to me, this conference we have had this evening and the pledges made by Mr. Shoop are most encouraging. If Mr. Shoop carries out the program he has intimated, he will stir up something in the high schools of this country that will make them take cognizance of the kind of work the students are to do when they go out. We have been proceeding in a haphazard way. I do not want to reflect on the educational system of this country, but I will say that a thing of this kind would have been absolutely impossible in Canada. They have a standard over there and that standard is lived up to, and if we have not a standard today established in our high school systems it is about time we made one. We cannot get students properly prepared for professional work along the lines of education we have heard intimated here tonight. The things that have been read to us by Mr. Tobias have been a perfect revelation to me. We should have had this meeting about twenty years ago, and then we would have been making some progress.

I want in the brief time at my disposal to make a few remarks along the line that has been discussed in connection with the four year course. I believe Dr. Koch has made a very pertinent suggestion in this connection, and that is, that this question must be worked out by each individual school. It is impossible to get men to believe exactly alike concerning anything that is as new as this is, and we must have conferences and deliberations and discussions, and I believe in the coming year we will be nearer together than we have been before. The only way to study this matter is to have such conferences as we are having tonight and then pick out, as has been intimated by Dr. Noyes, a plan that is best for the ultimate good of the student.

I want to thank Dr. Moorehead for outlining the idea of rhetoric as taught in the University of Minnesota. I was not informed until now that this applied so directly to all of the things that will be taught in the dental curriculum itself. It is a valuable thing and it appeals to me, but I do not believe the impression given by the published curriculum of the University of Minnesota in outlining its topics has been correct. I do not recall just what the topics are in the freshman year, but it seems to me there is only one which relates to dentistry, viz., prosthetic technic. In their announcement they create a wrong impression. The curriculum should be outlined in detail, and if it is as Dr. Moorehead says, there will not be much objection to it. In a recent visit to the West I heard many objections to the Minnesota plan, because no dentistry is taught the first year except technics. That impression has gone out. Dr. Moorehead has enlightened us tonight, and I am grateful to him for it. This whole matter is one for careful deliberation, and I believe, Mr. Chairman, in the loyalty and harmony of the faculties of the three colleges in Chicago to bring this to an equitable and satisfactory settlement. Not that we should all teach alike, but by these conferences and deliberations that we shall arrive at a solution of this problem in such a way as to serve the best interests of dental education.

DR. ARTHUR D. BLACK:

I want to offer a suggestion to this meeting. At the meeting of the Teacher's Association in Philadelphia, to be held next January, the executive committee has provided that one session of that meeting shall be devoted to comparative analyses of the four year schedule as prepared by the different dental schools throughout the country. They will be presented in the form of a large chart tabulation by which at a glance the differences in the four year curriculum will be shown.

While sitting here this evening the thought occurred to me it might not be a bad idea a little later this year for our three schools to do that same thing first, so that the schedules can go to Philadelphia from Chicago and be more nearly alike and closer together than they would be otherwise.

DR. F. B. MOOREHEAD:

I would like to ask Mr. Tobias if he meant to convey the idea that the whole high school curriculum was optional? It would seem that Dr. Johnson and others got mixed with reference to it.

Mr. Tobias:

No, sir.

Dr. Moorehead:

I know that certain high schools require four years of English and a certain amount of mathematics and a certain amount of language. They exact minimum requirements, I believe, in all high schools. I do not know how many units they require, but certainly the high schools of America have not a complete optional curriculum. But that has been the impression conveyed.

Mr. Tobias:

I am glad you raised that question. What I meant to say was the requirements for examination for entrance into your college by the state board as to those subjects were entirely optional on the part of the high schools of Chicago.

Dr. Black:

How many subjects?

Mr. Tobias:

There are twenty-five subjects which the state board has outlined for your preliminary examination or for entrance into your schools on the optional list. These are Latin, Greek, French, German, Spanish, botany, English second year, botany second year, chemistry, ancient history, freehand drawing, commercial geography, English history, mediaeval and modern history, solid geometry, advanced zoology, physiography, astronomy, trigonometry, economics, physics, United States history, mechanical drawing, music, household arts or household sicience, and the history of art.

If you will compare them with the examination for admission to dental colleges, issued by Swift, Downey and Armstrong, Superintendents of Public Instruction of the state, you will find they are all on the optional list of the high schools of Chicago.

Dr. Brophy (closing):

I am very glad that my effort has interested the members of the college faculties enough to have brought out such a discussion as we have heard this evening.

There is one question that has been mentioned by Dr. Johnson and some of the others that has been particularly impressed upon me. There is no one at fault about this preliminary standard of education but ourselves. Let us be honest about this thing.

Let us admit our weaknesses. It is not limited to ourselves here tonight, but it is the profession at large that is to blame. I called upon Mr. Shoop for the purpose of getting some information about the schools. When I told him what I was going to do, it occurred to me it would be a good thing to bring him here, and then later I thought Mr. Downey would be an important factor in this meeting. Happily, I got in touch with Mr. Tobias, and he brought here Miss King, a representative of the legal profession, who is deeply interested in the subject. I had the temerity to invite her to speak. I am very glad I did. The point I was going to make about this question is this, and the reason we are to blame is this: Mr. Shoop told me, so far as he knows, this is the first time in the history of professional education in the city of Chicago that a man connected with a professional school ever made an appeal to the head of the school system for information as to why they do not better prepare students for entrance into professional schools. Who is to blame for this? We are, and we must admit it. What position does Mr. Shoop occupy? He is the President of the Federation of High Schools of the United States of America. He told me that at the next annual meeting to be held in Denver next fall it will be his duty as its president to deliver an address, and, said he, our conversation has suggested my theme;—the preparation of students for special vocations. When you look at this book (exhibiting book), the Chicago high school curriculum, you will find it has a preparatory course for almost every occupation under the sun. I am not going to take up your time long enough to tell you what is in this book pertaining to occupations, and name to you the occupations that are announced in this book. This book contains the course of study of the high schools of Chicago epitomized. The first course of study outlined is a general course. The next course is a science course, and the third a normal college preparatory course. Fourth, a commercial course; they are four year courses, all of them; five years of office preparatory, a technical course, a general training course, household arts, and United States art course, and an architectural course. The only one that is in any way related to our work is the preparatory course in pharmacy. There is a course in accounting, a course in physiography, a course in mechanical drawing, a course in designing, a course in pattern making, a course in machine shop, a course in electricity, a course in household arts, a course in horticulture, etc. There is nothing about the courses leading up to the university course for law; there is nothing here looking up to the course in medicine or in dentistry.

I said to Mr. Shoop, how is it you have all these preparatory courses for the different occupations and absolutely no reference to the other courses—law, medicine and dentistry? They are the most important courses to be considered—courses that have to do with all the business relations in life and medicine and dentistry; which have to do with the health and lives of the people. Why do you not prepare students for entrance into these professions? He said he didn't know. He had overlooked the legal side of it. There is no preparation for the course in law. We have been told by Mr. Tobias all there is in the course that pertains to our craft is optional and the student need not take it in the high school course unless he wants to.

What may we expect from high school graduates under these present conditions? As Dr. Johnson has pointed out, we should have made this appeal for more thorough preparatory education twenty years ago. We want the Superintendent of Schools to prepare students for *our work.* Will he prepare them? What we want to know is whether the high schools intend to prepare students for our courses of instruction and how we are going to succeed in getting them to do so.

We have made the first step to that end in this city tonight, and I sincerely trust this movement will be carried forward and that we will find by and by the high school graduate will come much better prepared than at present to engage in his professional studies.

Something was said about a supplementary course to the high school following graduation in preparation for the professional course. If the high schools will conduct such a course it will be better than for us to teach these things.

I do not disapprove of what is being done in Minnesota, but it is unfortunate that they did not make it clear in their announcement. I hope, and I sincerely believe that the high schools of this country will get the greatest jar they have ever received when Mr. Shoop shall have delivered his address next fall. I want to read that address and see what he has to say.

I was talking to a bright, intellectual boy of fifteen years yesterday who is attending the finest high school in this city, namely, the Nicholas Senn High School. The school building is really an architectural gem in construction. This boy is very enthusiastic, like all boys, in his high school work. He said, they push us along in order to get us through, and the teacher who gets the greatest number of students through is considered a great and popular man. He does this for his own credit. If that is the case, and I have no reason to question what the boy said, it is not right for the high school teacher to crowd students through. It is the business of the head of the schools of this city to see that kind of work shall not be done.

Regarding the plan of taking up rhetoric, syntax, grammar, spelling—if we were to establish a spelling school in our college I believe it would be a good thing. That work should be done before the student is permitted to enter a professional school. We have no time for educational work. I believe in having students educated before they enter a professional school. We know how important it is for students to have preparatory educational work, but that is the function of the school, academy or college, and not of the professional school. Let a student deliver an oration on any subject within our curriculum and we can mark him for his scholarship if we wish, but that keeps him within the professional teaching. Dr. Moorehead has related what the student is required to do in Minnesota, namely, to make a speech of ten minutes pertaining to a subject related to dentistry; that is all right. It would be a good thing if we had a lyceum and called upon students to indulge in debate. It would develop them in many ways. It would enable them to discuss subjects and better prepare them for their duties as members of dental societies and for general professional work. It would make them better men in the presence of their patients. They would be better able to explain to their patients the why and the wherefore of these things.

Regarding the remarks made by Miss King, she is right. Agriculture is a very important department of education, in verification of which I will refer you to this very successful farmer, Dr. Gilmer, who is teaching farmers round about where he has a farm, teaching them the science of farming, intense farming, and how to accomplish a great deal more with the farm, how to get out of farms crops that farmers never dreamed they could get. He is doing the kind of work that the University of Wisconsin is doing throughout the whole state of Wisconsin, carrying the influence of the university to every school district, teaching them how to raise better wheat, better oats, better horses and cattle and increasing the wealth of the state. Our agricultural school in the University of Illinois is also doing wonderful work.

Regarding the question of preliminary training, long ago in Europe they have had a standard of education that was fixed. The German schools have the gymnasium; they have had forty-eight counts in France, which is equal to a high school education, for a long time, and if I had time I might go over all countries and tell you what has been done. Every one here who has been engaged in teaching for any length of time knows that beyond the question of a doubt that a student who comes here, having taken the first course in the Royal College of Dental Surgeons or in any of the other Canadian schools, is educated. We know it. He has the kind of education that enables him to go on with his professional studies in a most satisfactory manner. Why cannot America, with all its greatness, have and conduct high schools on an equality with the schools of our neighbors across the border, but they have not up to now succeeded in doing so. Let us hope they will. We know that when a Dutchman comes here and enters our schools he is an educated man. There is no doubt about it. Before the end of the first year he is a better English scholar than a great many of the men who have passed high school. I do not think there is any doubt that Dr. Black, Dr. Moorehead, and Dr. Jones, who have spoken, favor introducing a plan of academic work in our schools. They are doubtless sincere in what they say. Maybe it would be better to have the kind of work they are doing in Minnesota, but I say let the students go back to the schools for their preliminary education. They ought to go to school; we are not barring them from going to school, but we ought to bar them from entering our colleges without the requisite preliminary education. It is not our duty to teach rhetoric, syntax, etc.

There are a great many schools in the United States that are not as strong as our schools. If they analyze the curriculum sent out by the University of Minnesota, which was extraordinary for a dental college, with practically nothing in the first year about dentistry except prosthetic technics, they will at first be bewildered and will hardly know what to do. I do not find fault with anybody, but I am here to tell you exactly what I believe. What will be the effect? This will be the effect, and that is the thing I am afraid of. Schools here and there all over the country will say: "In the University of Minnesota Dental School they devote the first year to school work, or to the work of the school of liberal arts, and we will do that, too. A man comes who has been to college; he has passed what they require the first year in the University of Minnesota, even more, he is a college graduate; we will put him in the second year—he can make up his work in prosthetic technics." I believe this will be done. If it is, it will destroy what we have been working for during thirty years, namely, to establish a four year course in dentistry in all American dental colleges. The plan talked about here tonight will defeat a four years' course in dentistry, if insisted upon. The course proposed by the University of Minnesota Dental Department is in the first year only a partial course; the greater part of it will be devoted to preparatory studies. The full course will therefore consist in a little work in dentistry in the first year, followed by three full courses.

If that is done, the four years' course will be a thing of the past. Other schools will have as good a right to say: "This boy has had this work in another university and we will put him in the second year." We have been through this kind of trouble before. It has been a long, tedious struggle to secure the adoption of a four years' course of study in our dental schools. I shrink from the thought of seeing another revolt from our four years' course.

If the Chicago colleges will firmly stand for the maintenance of four full academic years of dental training, it will counteract to some extent, at least, the statements that have been made in preliminary announcements that certain colleges do not intend to have a four years' course in dentistry, since four-fifths of the work of the first year will be devoted to the study of preparatory branches.

The broad view of this subject, and I believe the right view, is to do all we can to aid *all* of the colleges to reach a higher standard. The strong colleges of this country should create a standard up to which other colleges can come. The strong colleges of this country should create a standard that other colleges will live up to.

If the colleges adopt a curriculum including certain branches of study that belong to the preparatory school, then the four years' course that was adopted after a long struggle will be a thing of the past. There will be no school government. There will be no organization. It will be said by other schools, "We have just as good a right to admit students who have had the kind of training which may have been taken in some other schools, as *they* have, have we not?" What are you going to say? You will have to say yes. You will have no organization, no rule, no federation of colleges enabling you to bind the schools together, and the condition of education will grow worse instead of better. The strong schools should stand firmly by the agreement made, but they will not do it if they introduce academic branches in the dental college course.

Before adjourning this meeting I want to say that I am heartily in favor of having as well educated men in our profession as there are in other professions, but I do not approve and never can approve of setting aside these precious hours for which we have struggled for over thirty years in which to pursue professional studies, to indulge in preparatory work which can be and should be demanded before the student enters. I can understand how men may disagree in their views. But can anyone say why students should not come prepared to begin professional study? If they are not so prepared, can you give me a reason why they should not be sent back to school? Is it possible that the United States cannot educate as well as Canada or Europe? Did you ever hear of a professional student in Canada or Europe studying rhetoric, syntax, etc., in a professional school? American academies and colleges are capable of educating students, and we will soon find that the educational system of our country will change and improve and be able to meet all of our requirements.

We have tonight set the ball rolling, and whoever lives and teaches five years from now will see a marked change in the high school work of this country. While I would not suggest that our small effort in Chicago will have any great amount of influence, we have here men who are great educators, men whose voices in educational meetings throughout the country will be heard, and I am satisfied that when these voices are heard, all men engaged in educational work will take heed.

I really believe that Mr. Shoop, this evening, when the discussion was going on concerning the statements I made in my paper regarding high school graduates, felt keenly the shortcomings of the schools. Ours is a great school system, but it is sadly at fault in meeting the expectations of men who have been endeavoring for years and years to get a standard which we hoped would solve the preliminary educational question. I believe that Mr. Shoop will do the best he can to improve the conditions in our schools. When I told him there was no provision in the high school curriculum for preparation for entrance in our schools, he said there will be work done leading up to higher education along the lines that you have suggested. Let us, if you please, have two years in the university or two years supplementary to the four years in the high school for further preparation. If we do, students for professional study would be fitted to that end, which would be vastly better than to have them passed along with nearly all the subjects bearing on our work, optional in the high school.

Something should be done to stimulate the high schools to do better work. If something were done in this direction it would be for a good purpose, and I believe we have started it tonight. To those of you who do not exactly agree with me, I wish to say that I shall not find any fault with you any more than to say that I sincerely believe it is a mistake to introduce a course in rhetoric, syntax, etc., in our professional schools. We cannot afford to spend time on such studies. Let the student learn them before he comes to us.

I feel deeply on this subject, and sincerely believe that the men here tonight, as the years go by, will be enthusiastic workers for professional education and for professional advancement. (Applause.)

A vote of thanks extended to Mr. Shoop, Mr. Downey, Miss King and Mr. Tobias brought the meeting to a close.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-SECOND ANNUAL MEETING HELD AT SPRINGFIELD, MAY, 9-12, 1916.

DISCUSSION OF DR. P. G. PUTERBAUGH'S REPORT OF DENTAL SCIENCE AND LITERATURE.

Dr. J. P. Luthringer, Peoria:

Discussion of the report of the Committee on Dental Science and Literature this year marks an innovation in our regular program. The idea was rooted in a desire to give this report added importance. In what manner this was to be accomplished and what form the discussion was to take are not clear to me. Whether it was meant to discuss the report per se, or to emphasize and amplify the high lights, or to make a supplementary report we are unable to state. As to the first suggestion a paper of this character does not lend itself easily to discussion: as to the last suggestion which seems reasonable, that is out of the question just now for the reason that the member first selected for this task confessed inability to complete the assignment at such a late season that his gracious successor was forced to work under forced draught, and the result of his efforts reached us just five days prior to the meeting. In order to in some manner discharge the obligation resting upon us, we must perforce content ourselves with emphasizing some of the fields which, as shown by the report, are at present challenging the attention and concern of the profession at large.

Under the sub-head of Metastatic Infections the essayist recounts the fact that more papers have appeared upon this subject than upon any other one topic. This is gratifying in the extreme and lends color to the belief that the profession is preparing to answer affirmatively the question propounded by Dr. Mayo.

The astounding statement that "carefully compiled statistics show that in the mouths of young adluts, between the ages of twenty and thirty-five, there is an average of about eight areas of gingivitis per mouth, and that more than half of such inflammations are due to defective dental operations" is a tragic exposition of the fact that we are conserving the organs of mastication at the expense of the bodily well being of the public. What a horrible indictment against our proud profession, in behalf of which we have exhausted the superlatives of the English tongue in singing the praises of her rapid and comprehensive progress and accomplishment.

Perhaps the plea of ignorance will serve as a kindly mantle of charity in condoning our grievous errors of the past, but it will no longer serve for the present and the future. From now on there is only one term which will adequately fit our willful sins of omission and commission in this connection—it is criminal. Nowhere is the golden rule so applicable as in the professional relationship between dentist and patient. And if every operation we perform will stand this test the weight bearing down on the shoulders of Atlas will be infinitely lessened. We are busy men, it is true, and if any of us cannot find the time to read current dental literature exhaustively, at any rate let us resolve to spend one evening a month in reading the various ramifications radiating from the caption—Metastatic Infections. If we profit thereby it will make us greater benefactors, better dentists and better men.

Next in rank and closely allied to the foregoing is the subject of Oral Prophylaxis. The essayist informs that this has been one of the "most profusely discussed subjects of the year." I may add, let us hope this procedure was also most profusely adopted by operators in the daily office routine. I was lugubriously amused at the essayist when he conjectured "just what the average dentist has in mind when he talks 'prophylaxis' to his patients." I am riding tandem with him on that query. Some half dozen years ago I seriously took up the technic of oral prophylaxis. From time to time I have quietly taken census among my conferees in this connection, and it is surprising how few, relatively, are following a systematic procedure. "Have you taken up oral prophylactic work?" usually receives an affirmative reply. Upon closer questioning as to method, instruments, accessories, etc., used, the affirmation is qualified in the general statement that "I have no special method or instruments but I am doing more careful work with the scalers I have." To gain interest and to get them started in the work I have, in a number of instancecs, accorded an invitation to accept an appointment that I might demonstrate in their own mouths as much or as little as I had acquired; also demonstrate the application of the instruments and accessories used. Sad to relate, not a single one availed himself of the opportunity. Now, why inject this personal experience? Because it brings us back to the essayist's conjecture. The answer is, every man of us must seriously take up the work of oral prophylaxis along well defined lines of rational procedure, so that when we talk of prophylaxis to our patients we can back it up with the necessary technical skill and manipulation.

Root canal work is responsible for so many papers that the essayist has characterized the contributions as "both abundant and profuse." This is a most encouraging condition for there is plenty of evidence that we have been remiss in this department. This particular work is one of the most important, and also the most arduous and painstaking that falls to our lot. Nowhere does disaster pursue haste and carelessness so relentlessly as in root canal work: disaster to the tooth and to the possessor thereof, even to the point of endangering the very life of the patient. Let the perusal of the many papers on this subject inspire us to render the very best service we are capable of; let us not consider the time, effort and small remuneration as insurmountable barriers in accomplishing successful results. Let us strive to do the work in such a manner that if failure come we can conscientiously feel we have done our best, and not be obliged to bow the head in "mea maxima culpa," as was too often the case in the past.

Local anesthesia has claimed considerable space in the journals, the most important phase being conductive anesthesia. Properly used where indicated it is of immense value to the dentist. The note of warning takes the form of caution in the matter of sterilization of instruments and fluids employed. Recently in discussing conductive anesthesia an oral surgeon of wide repute was asked if he thought it safe to advocate this method for use in the rank and file of the profession. I surmised his answer, which was: By no means. Matters pertaining to asepsis and sterilization of instruments are not observed by the rank and file of our profession. The rich vascularity of the oral cavity has protected them from disaster and made them careless. But when you inject into the deeper areas of the mouth, or at points distant therefrom, serious trouble is bound to ensue unless you thoroughly understand and religiously follow the requirements necessary to maintain asepsis.

PYORRHEA.

Pyorrhea alveolaris and the inevitable Emetin Hydrochlorid are touched upon without particular comment. Let me say a few words about emetin. We know by clinical experience and observation that after a course of Emetin the pus is checked or nearly so, inflammation subsides and the gums are reduced from a flabby, spongy condition to that approaching normal in color and texture, hugging nicely around the necks of the teeth. Now, I believe Emetin is of value at the beginning of the treatment—in fact a great aid in preparing the case for that all important procedure, instrumentation. In other words, a pre-scaling or pre-treatment adjunct. The gums are reduced to a proper condition for beginning the instrumentation, for the matter of pain is not so great a factor, profuse hemorrhage is eliminated, and the danger of carrying infection to the deeper areas is greatly reduced. I am impatiently awaiting for a case of stomatitis to present to determine the virtue of emetin in relieving the painful conditions in the acute stage.

CHICAGO DENTAL SOCIETY.

A regular meeting was held Tuesday evening, May 16, 1916.

President F. B. MOOREHEAD, in the Chair.

Dr. Marcus L. Ward of the Department of Dentistry, University of Michigan, read a paper on "Our Present Cements and Their Uses with Special Reference to Those Containing Copper."

DISCUSSION.

DR. WILLIAM HENRY WELKER:

I want to congratulate Dr. Ward and the University of Michigan on the making of scientific investigations along these lines of dentistry. The hope of advancement in dentistry lies with our schools, supported by state funds and with private schools with heavy endowments, which employ men to investigate these dental problems. Every such dental school will ultimately have a number of full time scientifically trained men who will devote their time to teaching and scientific investigation for the advancement of the dental profession. What such men add to our present knowledge will be one factor. The second factor will be the stimulation of their students to do original investigation. When the members of the rank and file are personally interested in the development of their science, dentistry will make wonderful strides. This we hope for in the next ten or fifteen years.

There is one thing in Dr. Ward's paper which has struck me as foreign to my experience, and that is the constant reference to proprietary names. In medical science all reference to proprietary names has been eliminated and things are referred to in abstract scientific terms, regardless of the name of the maker. The time is coming when dentists will dictate their own formulas to the manufacturer, rather than the manufacturer advertising formulas which have been prepared for him.

With reference to the efficacy of copper as a germicidal agent, when copper was first used to destroy algae in drinking water, and it was found that one part of copper sulphate in a million parts of water was destructive, copper was hailed as a strong bactericidal agent. Much work has been done along these lines, and the results have been disappointing. It has been found that the concentration of 1-1000 is necessary to inhibit the growth of putrefactive bacteria, and the concentration of 1 part in 20 is necessary to destroy anthrax, and 5 days' time is required. Copper is not efficacious along these lines, as has been hoped.

I should like to ask Dr. Ward how many times the series of bacteriological experiments were repeated, and also why the saliva was diluted rather than used in the original concentration, and whether the experiments could not have been carried out in the living teeth. Two points have been raised in my mind, the first is the question whether the bacteria in the saliva, growing in the air, would not be of a different type qualitatively. Would that produce a condition different from the condition of the experiment? The second point is the influence of living tissue on the solubility of the copper in the fillings. The third point is the relatively large dilution in 10 cc. of liquid, distributed all through the liquid. There would be a thin film of liquid. I am curious to know whether the effective area would not be at the utmost a minute film for the destruction of the bacteria. I would like to ask whether the same liquid was used in the setting of the cement throughout the experiments. The reason I ask is, on account of the possible operation in the concentration of the hydrochloric acid as influencing the solubility. Did Dr. Ward make any experiment to determine the difference in the solubility of the copper and the presence of the liquid, with zinc oxid present, and in the absence of zinc oxid? May not the presence of the zinc oxid interfere with the action that the liquid may have on the copper oxid cement?

Dr. J. E. Hinkins:

I have worked considerably on the zinc phosphate and on the silicate, aluminum silicate, etc., and the silicate cements, but I have not done very much along the lines of the copper cements except from a clinical standpoint. Our cements have been one of the weak points in dentistry for many years, but they have been improved very much.

Some years ago Dr. Ames read a paper before the Odontological Society of Chicago on copper cements, and at that meeting he showed a number of Petri dishes, showing the inhibitive properties of the different cements. And so, not knowing what course Dr. Ward was going to pursue, I got in touch with those bacteriologists and pathologists who conducted the experiments for Dr. Ames, and I used the cement about as the essayist has mentioned tonight. It was impossible for us to have taken saliva in the Petri dishes and plate it out because of the vibration of the buildings, and so we could not have seen what the bacteriological inhibition would be. And so we had to use agar, which was inoculated with the staphylococcus pyogenes aureus, taken from an abscess in the axillary space, and very thoroughly shaken. Then, after that was stirred up and the agar put in the Petri dish, the mixes of cement were dropped into the agar. I now have three Petri dishes of the different cements which will be passed around, and from these some idea may be gained of the inhibitive power of this cement. I presume the reason the essayist used the manufacturers' name here was because most of this discussion has been among the manufacturers, much more than among the dentists. Is not that right, Dr. Ward?

Dr. Ward:

Almost entirely so.

Dr. Hinkins:

On each of these dishes is the number of the cement, the name of the cement, and the growth is mentioned, and on holding them up to the light the presence or absence of the inhibition may be seen.

(Referring to the second Petri dish.) This is the same sort of inoculation. The numbers of the different cements correspond to the different mixes. This is an illustration which shows what the cements will do with agar. There is a vast difference between the physiological cell and the pathological cell, and we do not have the same conditions in the Petri dish as obtained in the mouth.

The potency of these copper cements as an inhibitor of bacterial growth was claimed by Dr. Ames and others from its clinical use, practically from the time it was first introduced. That runs back twenty or twenty-five years. Dr. Elliott Carpenter was one of the first to advocate its bacterial use. Dr. Ames granted inhibitive power to the white copper cement, equal to that of an ordinary zinc cement, but said they are comparatively negligible. At the meeting of the Odontological Society he showed it by means of inoculative agar in Petri dishes. I had these plates made so that we could draw from their showings some conclusions as to the clinical value of these fillings. They have a very decided bactericidal action.

I was a little surprised at Dr. Ward's quotation that Dr. Ames made only two experiments. I think Dr. Ames showed a couple of dozen at least, at the meeting of the Odontological Society. I would like to ask the essayist if he has ever seen the clinical evidence of Ames' phosphate of copper. This I have used continually in the back teeth, the second and third molars, and especially third molars, and also the deciduous teeth of children. I have been an advocate of Ames' old formula of the oxyphosphate of copper. Why does Dr. Ames insist that there should be moisture in the tissue next to the pulp for mummification, or as it might be called hydration or de-hydration or hydrolysis? To me this is one of the most important parts of this whole problem on copper cements. Here (producing same) are specimens of some teeth, from which we can get an idea of the mummification of dental tubuli or the dentin or the decalcification of the tooth structure in the organ of a pulp. Patients come in with cavities in their third molars and the pulp is not sufficiently exposed to warrant us in devitalizing, so we wish to fill them. In my hands this 100 per cent of oxyphosphate of copper has given the best results. These specimens show the results very beautifully. I have had very little trouble in treating teeth of this kind by this method. I have not had as good results from the white copper fillings in such teeth, and in the teeth of children, as with the black oxyphosphate of copper.

(Indicating.) If all the decalcified tooth structure is removed, we would have an exposed pulp and devitalization would result. Very gratifying results have ensued from the practice of bringing the cement over the nearly exposed pulp. What is the action which takes on and about the corner of this nearly exposed pulp? A new tissue appears to be formed there. It is a question whether it is formed by hydration, dehydration or hydrolysis. (Referring to same.) Whether this is the albuminate of copper or lactate of copper formed, there is a certain amount of colloidal substance. My observation is that there is a new substance formed there.

Where you have the two oxids mixed together and they are brought in contact with phosphoric acid or incorporated with the albuminate, the phosphoric acid will act on the zinc oxid first, and after that is used up, it will act on the oxid of copper. I do not think that it will act on them jointly.

A recent article in American Association of Science, by Jaques Loeb of the Rockefeller Institute, in the issue of May 13, says, in speaking on the subject of "The Relation of Osmotic Pressure Inhibition in Live Muscle":

"A series of independent observations by Nasse, the writer, Overton, Meigs, Beutner, Körösy, and probably others, have shown that the striped living muscle of a frog neither loses nor absorbs water when put into the solution of any sugar or neutral salt whose osmotic pressure is equal to that of a m/8NaCl solution, provided the salt does not injure the membrane. If the solution surrounding the muscle has a high osmotic pressure the muscle will lose water; if it has a lower one the muscle will take up water. Since there is only one variable in which the isosmotic solutions of different sugars and salts of the same osmotic pressure agree, namely, the number of molecules in the unit volume of the solution, we are forced to assume that the osmotic pressure is the driving force for the exchange of water between muscle and surrounding solution, provided that the surrounding solution does not destroy the semipermeability. This is not only true for the striped muscle, but also for the nerve (A. P. Mathews), for the excised kidney (Siebeck), for the red corpuscles (Hedin and others), for the sea-urchin egg (Loeb), and probably generally.

"In 1898 the writer called attention to the role of acid formation in the muscle upon the absorption of water. He had found that if the muscle lies for a number of hours on an isotonic solution of NaCl the muscle begins to absorb small quantities of water (p. 462), and he ascribed this effect to the formation of acid, probably lactic acid, in the muscle. The question remains, how the formation of lactic (or any other) acid can increase the absorption of water in the muscle. The writer assumed that this was due to an increase in the osmotic pressure of the muscle as a consequence of the acid formation; and this idea is, as he believes, correct. In 1898 he assumed that the hydrogen ion acted like a hydrolytic ferment and increased the number of molecules in solution in the muscle by splitting certain larger molecules into smaller ones. A second possibility is the increase of the osmotic pressure of certain celloids under the influence of acid as observed by R. Lillie, Moore and Roaf, and others. A third possibility is connected with the explanation of inhibition given by the work of Proctor, Pauli, and very recently Katz. According to this work we may assume that through a chemical combination of the acid with a protein the latter forms definite hydrates with water, in which process a diminution of volume with heat production occurs. If acid is formed in the muscle the proteins of the latter combine with the acid and with the water. The number of molecules of the water which one molecule of acid-protein (or rather one protein-cation) can bind seems considerable. This water is taken not from the outside, but from the solution inside the muscle.

"The direct driving force for the exchange of water between muscle and the surrounding solution is, therefore, again the osmotic pressure."

This opens up a new field entirely. If osmotic pressure can cause these changes in the muscular tissue, and the changing of water and sugar to acid, etc., what can they do under the conditions existing in a tooth of that kind, and what have they done to us dentists?

Dr. Neff has shown that there are actually 45 different sugars and they have been reduced to 4 commercial sugars. He has said that in the processes of assimilation these 45 sugars which were produced were reduced to 4. Dr. Acree and myself showed seventeen years ago that the action of enzymes on triacetyl glucose was reversible. Dr. Lawley York and myself demonstrated 25 years ago that egg and blood albumin was coagulated by escharotic substances and re-dissolved in from 12 to 24 hours, and decomposition of albumin is continually going on. Dr. Harlan shows where the cementum was removed from the root of the tooth and pulp chamber sealed perfectly at each end, that many different medicines would diffuse through the dental tubuli.

Does the copper phosphate act by resolution or infiltration, degeneration or by regeneration? All these salts show an inhibitive action on bacterial life.

Dr. C. E. Jones:

Dr. Ward has given a resume of the literature up to date on copper cements. He also discussed with us the work that they are doing at the University of Michigan in investigating the germicidal properties of some of the copper cements. I think there is no question about the germicidal properties of the copper cements, especially that portion which is known as the oxyphosphate of copper. The basic compound, black oxid of copper, is not germicidal in itself. It is the oxyphosphate of copper, the soluble salt that results from the combination of the phosphoric acid with the black oxid of copper that possesses germicidal properties. This is what we attempt to produce in order to secure germicidal and preservative action. Dr. Ames, perhaps, did not fully appreciate the germicidal action of the oxyphosphate of copper when he first presented this material to the profession. He was trying to obtain something which had good cement-making characteristics. Later on he realized that this combination had wonderful preservative properties; a fact that was also substantiated by the clinical observations of others.

This black oxid of copper is used extensively by the members of the dental profession, and that it does excellent work in arresting carious conditions is beyond question.

About three years ago some of the manufacturers appreciated the fact that the black oxid of copper was objectionable for use in certain positions in the mouth, because of its color, and they endeavored to produce a copper cement with the same germicidal power, and with a more desirable color.

Caulk's cuprous iodid was the first white copper cement given to the profession. This same firm also presented a red copper cement.

About the time these newer coppers came out I was associated with others in some work upon mouth bacteria and conditions arising therefrom. I was, because of my previous training, directed to do some bacteriological investigations, looking toward a determination of the relative germicidal properties of these newer coppers with the older black oxid. Instructions were given by those with whom I was associated in this work, that if these new copper products possessed virtues that even approached the preservative properties of the black oxid of copper we should investigate them thoroughly and that they should be made use of. A series of investigations was begun which extended over several months and the results showed great disparity between the germicidal action represented in the white and red coppers and the cements made up almost all of black oxid of copper. So great was this difference that our ability was doubted to produce the things our tests indicated. I have seen too many bacterial growths of mixed and pure cultures extending over the cultural field and the white and red copper cements in the form of pellets, both wet and dry, of various sizes, and maintained under conditions simulating mouth conditions, to even think of there being any similar germicidal action between the black and other coppers.

At times the slightest change in physical environment will destroy the virulency of the bacteria in the mouth. There are also times when their destruction is very difficult. Mouth bacteria fluctuate in their resistive powers. Experiments, therefore, must be extended through a long series in order to obtain results of a comparative average. Our investigations proved, to our satisfaction, that the oxid of copper is in a class by itself as a germicidal agent.

Cuprous iodid, or white copper, when mixed with phosphoric acid will not produce a germicidal agent, except in the early stages of the mix, because cupric iodide is formed with a liberation of iodin. As soon as the iodin is liberated from the white pellet, the germicidal action is lost. Cupric silicate has no germicidal action to speak of because the phosphoric acid does not dissociate the silica and the copper. The silica and the copper are too intimately tied up, chemically, for the phosphoric acid to dissociate them, and we cannot have any germicidal action from this form of copper. To be effective as a germicidal agent, copper compounds or salts of copper must be transferrable from any combination in which it may be existing to an ionic state. Neither Cupric iodide nor Cupric silicate are subject to this change when in contact with an acid of the low avidity of phosphoric, therefore, they are not good germicidal agents. Any salt or compound of copper that may be dissociated into an ionic state by the liquid medium of the cement or which may later on become soluble in the fluids of the mouth may be found to be germicidal, because the copper when in the ionic state may unite with the protein elements of the tooth structure and form a germicidal copper albuminate, or there may be a union between the copper ion and the ammonia of decomposing organic matter to form $Cu(OH)2$, cupric hydroxid.

The discolorations which all of the white copper cements eventually show result from a slight, and slow, dissociation of those cuprous combinations that have remained intact in the cement mix and are later broken down to lower compounds of the cupric class. In this way there is set free, usually upon the exposed surface of the cement, a copper molecule that is susceptible to union with any sulphur element that may be, for the moment, unattached or capable of being split away from its existing combination. The result of the union of the copper and sulphur produce a black copper sulphid, which brings us back to the same objectionable features possessed by the original Oxyphosphate of Copper made by Dr. Ames.

No one seems to have been able, up to this time, to produce a white copper cement that will not discolor in the mouth. This, I believe, is the present status of the white cement situation. The manufacturers have been trying to produce a cement having none of the objectionable features of the black copper cements, one that would give a wider esthetic range; but in making this attempt they have had to sacrifice practically all of the germicidal as well as the splendid cement-making properties possessed by black copper oxid.

I wish to congratulate Dr. Ward upon his able attempt to clear up the small bit of information the members of the profession hold in respect to this important cement subject. I know that he has great difficulty in reconciling some of the things he found in his investigations and those rather cryptic lines of information given out by some of the cement producers. But in spite of the difficulties that beset Dr. Ward he has succeeded in making a substantial advance in our literature and in the amount of information over that which we possessed before he began the exhaustive line of experiments outlined in his splendid paper.

DR. C. C. VOGT, Pittsburgh, Pa.:

Mr. Chairman and Ladies and Gentlemen of the Chicago Dental Society: It has been a great pleasure to listen to the very able paper of Dr. Ward, and the Chicago Dental Society is to be congratulated upon having heard what Dr. Ward had to say this evening.

Permit me to thank the Society for this opportunity of presenting the viewpoint of the Mellon Institute upon the copper cement question.

This discussion is presented from the standpoint of a chemist rather than that of a dentist. The Lee S. Smith & Son Company asked the Mellon Institute to conduct tests upon the germicidal efficiency of Copper Cements in order that they might know whether their cement is germicidal or not.

In these tests the quantities of cement used to a given quantity of saliva were selected because these quantities seemed to approach mouth conditions, since only a very small quantity of saliva or other moisture could be in contact with the cement in the interior of the cavity—i. e., the quantity of saliva under a filling is so very small that a saturated solution of the cement would be present under the filling. Hence our idea was to show the germicidal action of a concentrated solution of the Copper Cement on the organisms present in saliva.

These quantities were 10 hemispherical pellets approximately ¼ inch in diameter and ⅛ inch thick to 5 cc. saliva, while Dr. Ward has used in his experiments 1 cylindrical pellet approximately 1/7 inch by ¼ inch to 10 cc. saliva, or roughly about 1/20 the quantity used by Mellon Institute.

In our experiments complete sterilization was obtained in from 6 to 8 hours exposure, while in Dr. Ward's experiments those Copper Cements containing a low percentage of Copper showed 95 per cent sterilization after 24 hours exposure. In both of these sets of experiments the germicidal action of Copper Cements is plainly demonstrated.

Evidently the point in question here is what quantity of saliva should be sterilized by a given quantity of a cement in order to approach mouth conditions most closely. There is considerable chance for difference of opinion regarding this question.

From the viewpoint of a layman it seems that the primary requirement is that cement shall render the cavity itself sterile. Consequently one is led to the opinion that any cement which when used in the proportions employed by the Mellon Institute shows complete sterilization in from 6 to 8 hours, would be sufficiently germicidal to sterilize the cavities in which it is used.

Dr. W. V-B. Ames:

I want to join the Society in thanking Dr. Ward for coming to us with the results of disinterested investigation, which I have been sure would come in time from some such source. This work I look on as the beginning of the end.

When I concluded to call attention to what I called impositions on a too confiding profession, I expected to be antagonized by the people whose interests were affected, but feeling that I had the practical truths on my side, I have been content to simply sit tight and await such work as Dr. Ward and his friends have done and will continue to prosecute.

When, back of 1890, I carried on the experiments which resulted in oxyphosphate of copper, I had two objects in view. The first was to produce a more durable cement, and the second to impart germicidal properties, seeing the need in my practice of such a cement for desperate cases needing cement rather than any other material.

From using precipitated copper as an addition to oxyphosphate of zinc, the discovery was made that red and black oxids of copper were cement-making oxids and it was soon decided that the black oxid was the more desirable form, all things considered. The red oxid more readily enters into soluble copper salts, but the black more than offsets this by entering into more durable cement, very efficiently germicidal.

Such a cement furnished the means of accomplishing that which was the original hope, i. e., the embalming of decay residue, thereby making of this residue a better pulp capping than could be placed there, were the leathery remnant removed.

Having accomplished this as early as 1890, and the virtues of the resulting oxyphosphate of copper being well understood by a goodly percentage of the profession, I can assume a self-satisfied position, and worry little over the effusions of the gentlemen mentioned by Dr. Ward. As he gets the truth through laboratory experiments and clinical observation, he will tell the profession of the positive control of desperate conditions through the use of materials differing decidedly from oxyphosphate of zinc carrying 2% of a comparatively impotent copper compound.

I can even remain serene when accused of being "pseudo scientific," being truly sorry that the person quoted should show so little appreciation of the demands of the subject under investigation. This problem will be worked out in time, either by dental bacteriologists, or general investigators, working very much in touch with men well grounded in clinical dentistry, such as Dr. Ward and his associates.

The evidence of copper salt formed in the mix as shown by freshly mixed cement placed on moist filter paper (shown), while not laboriously scientific, should be more convincing to the clinician than any tube or Petri dish exhibition. If with one cement, copper salt is in evidence and with another it is entirely lacking, conclusions should be easy, if available copper salt is the thing desired.

A vital point which needs consideration in such work as that of Dr. Ward is whether copper salt is actually present in potent form for early efficiency.

While a germicidal cement is often seriously needed, I do not recognize the need of a copper or coppered cement, for all cement operations. A silicious cement will properly seal a clean cavity, and oxyphosphate of zinc satisfactorily attaches crowns to clean roots.

I will continue to contend that inhibition of bacterial growth must be shown in something more putrid than diluted saliva. This has been the weakness of the work of all of my critics.

Dr. Ward's results show Ames' oxyphosphate of copper as 100% efficient in diluted saliva, some other materials being comparatively lacking in inhibitive power, but this work does not reveal the comparative efficiency when tooth caries is to be controlled, i. e., when the very quintescence of putresence is to be combatted. Normal saliva, or saliva diluted to one-fourth strength, I cannot consider as furnishing the proper medium for comparisons of germicidal efficiency of cements.

I hope that Dr. Ward in continuing this work will employ some medium with which even a real oxyphosphate of copper will not be 100% efficient.

A real copper oxid cement will have a salutary effect on adjacent soft tissue, without easily appreciable waste of the cement mass. This effect is analogous to the salutary effect on tissues in contact with a silver drainage tube, although it is difficult to determine any waste of the silver.

What happens beneath fillings when the cement is placed in contact with moist decay residue is that copper salt will be leached from the plastic cement in exchange for some of the water present in the decay residue. The main mass of the cement sets to its best texture with a layer next to the decay residue in condition to readily form albuminate or lactate or to enter into some physiological effect, such as shown by the specimens passed by Dr. Hinkins, which has not yet been lucidly accounted for.

A phase of the subject needing to be kept in view for the benefit of the user of cements is whether it is more desirable to add to a zinc cement a copper oxid which will enter into the cement formation and give increased integrity, or to add copper compounds which do not enter into the cement formation and therefore impart weakness in proportion to the addition. I hope that Dr. Ward and others will give proper attention to this angle of the subject in their investigations.

Dr. Arnold:

The discussors all agree that a cement after having set must remain insoluble and stay where put. Then they say that in order to have any germicidal quality it must be disintegrated. I cannot harmonize these statements, and I would like to have them harmonize.

Dr. Ward (closing the discussion):

An invariable waste is granted which is, however, immeasurable. It requires a little solution of the cement to exert very much germicidal action.

In regard to the proprietary names, two or three of the manufacturers have mentioned names, and in order to straighten it out

I have done the same thing. I have not published nearly all that I know about it.

We know where we can get saliva which has the number of bacteria which Dr. Jones says are uncountable. These have been estimated at 2,000,000,000 per ccm., but when they come down through seven to twenty-four hours they are uncountable. We have reached a point where we can determine what the cements can do. The statement is erroneous that they will sterilize in eight hours. They will not do it under the conditions which I have presented. One of those workers puts 20 pellets of cements in from 10 to 15 cc. of saliva. I believe that this chart which I have made and shown will stand up in the order given.

There are at least three forms of copper in the cement. Take the black which shows cupric oxid. Take the various salts, and they will go to salts of copper. That means that there will be cuprous formed at the expense of the cupric. There is cupric and cuprous oxid, and it goes farther, so that the metal copper is evidenced on the spatula. You cannot tell me that any one particular salt is more germicidal than another. It is quantity in my opinion. Metallic copper can be put in with the same cement, and the same saliva, and under the same conditions and it will do the trick. It is not the particular copper salt which does the business. I am firmly of the opinion, after having been since 1906 associated with Dr. Spaulding of Detroit, and doing a great deal of bridgework for people affected with pyorrhea—I have used almost entirely a copper cement. That led me to do some work along this line, and I am very firmly of the opinion that copper cements will be found germicidal in proportion to the copper salts in them, provided that the solubility of the cements are the same, and those cements which have 25 per cent copper will be nil, if they are not acted upon. It has been pointed out by the discussors that a cement that had zinc and copper in it would have phosphoric acid acting upon the zinc, battery style, and that the copper would not be acted upon. We have no evidence that that is true. If that copper salt were to lie there untouched in that cement, it would yet be germicidal, because the copper salts are germicidal, and whether they are acted upon by the phosphoric acid has nothing to do with it in my opinion. If it is in there, the minute it is let loose on the saliva it will be germicidal.

THE DENTAL REVIEW.

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

BOIL IT DOWN.

In too many articles printed in dental journals, the effort seems to be to pad with verbiage. One of the great sins of writers, if not the cardinal sin itself, is to employ more words than are necessary to tell the story. This is an age of concentration and condensation, and the man who wants his articles to be read must learn to eliminate the superfluous. It is the short, crisp, trimmed-to-the-minute article that appeals to the modern reader; the article that goes straight to the core of the subject and digs out the essential facts, leaving the introduction and peroration to the imagination. Some articles have so much introduction, and such a never-ending conclusion that if the reader wades through all of it he has lost sight of the real essence for which the article was supposed to be written.

And strangely enough in many instances the verbal excursions in which writers indulge have little relation to the subject being discussed. There is a tendency to ramble, to go off into the by-ways of the subject rather than stick to the main thorofare. All of this tends to obscure the meaning which the author wishes to convey, and thereby to weaken the force of his argument. It is safe to say that most articles published in our journals would be greatly strengthened by being "boiled down." We once heard a man who is himself a very prolific writer make the statement that no paper written for a dental society should be longer than 3,500 words. We think that there are exceptions to this, and that some topics under certain conditions will require a longer treatment than this for their proper elucidation, and yet in the main we believe he was right. The very best paper will become tiresome if it is too long, and what is tiresome to listen to will likely be tiresome to read.

What a joy it is to peruse the article of a man who tells his story promptly and the moment he is through stops. We always read that man's articles again when we see them in print.

A good plan for a writer is to think intensely on his subject before committing anything to paper. Let him make headings of the various points which he wishes to bring out, and then when all is formulated let him put it on paper. After it is written let him lay it aside for at least a week—better a month. Then he should deliberately revise the paper and see how much useless writing he can eliminate from it. It will usually be found that after the first flush of composition is over many irrelevant passages can be taken out to the great improvement of the paper. A writer owes it to his readers that what he presents for their consideration shall be in the very best form, and while many men who have excellent ideas do not find it easy to express them on paper, yet most of those who write for dental journals can greatly improve their product by a general process of "boiling down."

BOOK REVIEWS.

THE INTERNAL ANATOMY OF THE FACE. By *M. H. Cryer, D. D. S.*, Professor of Oral Surgery, University of Pennsylvania; Oral Surgeon to the Philadelphia General Hospital; Second Edition, Revised and Enlarged. Octavo 360 pages, with 377 engravings. Cloth, $4.50 net. Lea and Febiger, Publishers, Philadelphia and New York, 1916.

The name of M. H. Cryer on the title page of a book on this subject is sufficient guarantee that it is the latest and best presentation of the subject to date. Dr. Cryer has given much of his time and energy for years to the study of the anatomy of the head and face, and anything he has to say on the subject may be considered authoritative. In the present volume the illustrative work is particularly fine, especially the anatomical sections and the X-ray reproductions. Probably the chapter of greatest interest to the general practitioner is the one on "Teeth Influenced by Irregular Eruption," in which are shown many cases of impacted and supernumerary teeth. This is intensely interesting and most instructive. The author's references to variations in anatomical structures are well worth a careful study, tending as they do to relieve the subject of much of its previous confusion. We commend the book most highly and congratulate both author and publisher on its production.

PROFITABLE PRACTICE. By *George Wood Clapp, D. D. S.*, Author of "Brother Bill's Letters," "The Mechanical Side of Anatomical Articulation," "Prosthetic Articulation." Editor of *The Dental Digest.* 405 pages. Published by the Dentists' Supply Co., New York, 1916.

It is well that every dentist should aim to make his practice profitable, and Dr. Clapp has tried in this book to show how this can be done. It is largely a compilation and systematization of the articles that have appeared from his pen under the title of "Brother Bill's Letters" in the *Dental Digest.* Those who know Dr. Clapp personally must be assured of the fact that he would not argue for any plan which did not take into consideration the patient's point of view as well as the dentist's, and we wish that in this book he had emphasized this fact a little more clearly. To some dentists we fear that the obligation to the patient is rather a hazy matter, and it cannot be too often urged upon dentists, particularly the young dentist, that if the practitioner loses sight of his professional obligations he will not only lose his professional status but in the end he will not profit financially. Dr. Clapp has gone very carefully into the subject of the varying cost of operations of different kinds to the dentist, and it is high time that this matter was studied by the practitioner. In the past too many men have performed operations for a given fee without realizing how much these operations have cost them in time and money. The author has given a great deal of thought to the various phases of practice management, and has brought it to the attention of the profession in a very readable manner. So many subjects have been considered that it is impossible to mention all of them, but the book as a whole may be read with profit by the profession.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Finish a Silicate Filling:—We are told that the last thing to do to a synthetic filling before leaving it for the first setting is to "puddle" it by patting. This same result may be accomplished without touching the filling, by gently tapping the tooth. —*J. F. Nelson, Chicago, Ill.*

Opening a Sore Tooth:—In opening a tooth that is extremely sore with gas or pus where the canals are open, open up the tooth as much as possible and have the patient set the tongue in this opening and give sucking motion. This invariably relieves the gas or pus pressure in the roots and saves the dentist as well as the patient a good deal of trouble.—*C. E. Allshouse, Chicago, Ill.*

Heater for Water and Spray Bottles:—Get an aluminum pan about three inches deep and six to seven inches in diameter (with straight sides if possible). Cut a hole in the side large enough for an electric light receptacle to go through, cut holes in bottom of pan for your glass of water and spray bottles. Put a four-candle power carbon lamp in the receptacle and turn on the juice, and you will have warm water all day long without further bother.—*Edward T. Evans, Decatur, Ill.*

To Obtain an Absolutetly Correct Bite in Full Upper and Lower Dentures:—In making metal plates, whether of gold or cast aluminum, build a ridge on each plate with compound for the bite. Cut a thin sheet of aluminum and burnish it to the upper compound. Let the patient wear the plates for several nights. The aluminum should not be left level so that it will cut into the lower compound which is to be built sufficiently high to admit of this cutting. The aluminum keeps the two compounds from sticking together from the heat of the mouth. When the plates are worn down to the desired length it will be found that a perfectly accurate bite has been obtained.—*G. H. Henderson, Springfield, Ill.*

Cotton Rolls for Use with Broach:—Cut cotton rolls about an inch in length. With a pointed instrument punch center of roll to make it protrude at the opposite end and from this end pick the admirably long and clean fibres for winding on broach.

A convenient holder for above cotton rolls to be worn on the little finger of the right hand consists of a cheap finger ring—wedding ring form. Cut through one side to make it adjustable in size and round and polish ends. At point opposite cut in ring solder at right angle a plate of German silver 1 inch by ¼ inch; attach to this plate a pointed wire or pin which will engage side of cotton roll holding it in readiness to pick therefrom the fibres with the left hand.—*J. T. Search, Onarga, Ill.*

Cast Lower Dentures:—For many years I advocated and made cast lower dentures. The second denture I made for my own flat lower jaw was a cast plate. Shortly after placing it in the mouth I leaned forward to speak to a student who was sitting. The plate slid forward as there was no margin on the lingual side, this class of cases not admitting of one. I wore it to bed, and upon lying down it slid into my cheek. I have had no further use for the heavy plate. My twelve years use of the flat lower jaw has taught me that it is not only undesirable but that the rubber plate is as good as anything for the lower jaw. The lower alveolar process disappears more than the upper no matter what is worn or whether anything is worn.—*L. P. Haskell, Chicago, Ill.*

To Relieve Pain in Incipient Alveolar Abscess or in Neuralgia:—Sometimes the pain is vague along one side of the jaw and not easily located. If it is found impossible to decide on any one tooth as the seat of the trouble, the pain may frequently be relieved by taking some menthol crystals, about the quantity that would lie on a dime, and placing them in half a teaspoon of water and holding the spoon over the gas till the crystals are melted down in the liquid. Dip some cotton in the melted menthol and pack this between the cheek and gum on the affected side. The menthol will sooth the pain and frequently relieve it entirely. This is also an excellent remedy for clearing out the head and facilitating the breathing where the nasal passages are stopped up with a cold. In this case pack the saturated cotton under the upper lip. It will be found a great relief.—*Ed.*

MEMORANDA

FLORIDA STATE DENTAL SOCIETY.

Officers for 1917: Dr. Jesse L. Williams, president, Jacksonville; Dr. A. B. Whitman, 1st vice-president, Orlando; Dr. J. S. King, 2nd vice-president, Mariana; Dr. D. D. Crews, recording secretary, Fort Myers; Dr. M. C. Izlar, corresponding secretary-treasurer, Ocala.

TENNESSEE STATE DENTAL ASSOCIATION.

The officers elected for the 1917 meeting, which is Golden Jubilee year, are as follows: Dr. D. M. Cattell, president, Memphis, Tenn.; Dr. C. O. Rhea, 1st vice-president, Nashville, Tenn.; Dr. Stanley Rich, 2nd vice-president, Nashville, Tenn.; Dr. C. E. Hines, recording secretary, Memphis, Tenn.; Dr. Frank Wiggins, corresponding secretary, Knoxville, Tenn.; Dr. Jas. W. Winn, treasurer, Nashville, Tenn.

THE CHAYES DENTAL CLUB.

On June 15th, 1916, the Chayes Dental Club held its first meeting at the Hotel McAlpin, New York. It is composed of forty dentists who have adopted the Chayes system of movable, removable bridgework in their practices, and have banded together for study and mutual help and to further propagate the idea among their fellow-practitioners.

It is proposed at subsequent meetings to hold open discussion on the all-important subject of bridgework, and to conduct clinics demonstrating the beneficial effect of Chayes bridgework in the human mouth.

The Society invites correspondence with dentists in New York and other cities who are doing the work or are interested in it.

President, Dr. Philip Hussa, 8 West Fortieth street, New York.
Secretary, Dr. J. O. Lief, 320 Fifth avenue, New York.

THE SOLDIER'S TEETH.

A record of 2,634 dental operations during the two days in which the Forsyth Dental Infirmary gave free treatment to the militiamen is merely one more proof of the blessings this endowment has brought to humanity.

The condition of some of the teeth of the militiamen revealed astounding neglect, and the charitable work of last Saturday and Sunday means that exactly 419 men have gone to the Mexican border in a condition of dental preparedness.

Drilling on a parade ground is a fundament of military efficiency, but dental drilling on a grumbling molar is also essential in the making of a real soldier.

Dr. H. D. W. Cross, director of the institution, said recently:

"The European war has emphasized the necessity of caring for the teeth of soldiers. Some of our operators who have been abroad report that wounded men whose teeth are in good condition recover from their injuries in half the time required by their comrades whose teeth have been allowed to decay. The rough food, change of climate and dampness incurred in active service aggravate ordinary tooth troubles. The German government realized this 15 years ago, and among the wounded Germans few are found whose teeth are imperfect. England and France, on the other hand, have neglected this very important item, and both nations are now feeling the effects of the neglect."

Now that the Forsyth Dental Infirmary has returned to its normal field of charity for children, the Tufts Dental School has taken up the military work through the courtesy of President Bumpus. It will be edifying to compare the physical status of the Boston troops a few months from now with the less fortunate troops from other states.—*Boston News.*

THE TAGGART LITIGATION.

We publish herewith a court decision, together with a statement prepared by the Dentists' Mutual Protective Alliance explanatory of the action of the court:

Appellate Court Decides Doctor Taggart Cannot Sue the Dentists Collectively.

On June 13, 1916, The United States Circuit Court of Appeals for the Seventh Circuit rendered its decision that Dr. W. H. Taggart cannot undertake to enforce his claims by bringing suit against dentists jointly or collectively.

No questions as to the validity or scope of the Taggart patents were involved in this appeal.

The question as to Dr. Taggart's right to maintain a single suit against all of the alleged infringers in a given district came before the Court of Appeals as follows:

About two years ago Dr. Taggart's attorneys began sending out letters to the dentists in Chicago and northern Illinois, demanding that they pay Dr. Taggart $150.00 within five days and threatening to commence an infringement suit if they failed to comply.

Dr. Taggart immediately began separate suits against those who did not promptly meet his demand. The Dentists' Mutual Protective Alliance was then organized, and its attorneys, C. C. Linthicum and Lynn A. Williams, of Chicago, undertook the defense of those of its members against whom separate suits had been brought.

Some of those against whom suit had been brought, settled. Dr. Taggart then abandoned his separate suits against those who would not settle, and brought a single suit against scores of dentists, adding to that suit from month to month. Finally after five hundred and twenty-three defendants had been brought into the one suit, Judge Kenesaw M. Landis of the United States District Court, before whom the case was pending, ordered that Dr. Taggart should join no more dentists as defendants.

When this collective suit came to trial, in June, 1915, the first question to be raised was that of Dr. Taggart's right to deprive each man of his day in court by suing all of them jointly. Upon this question, Judge F. A. Geiger, before whom the matter was tried, held that there was an improper joinder of defendants and dismissed Dr. Taggart's suit as to all of the defendants, save one.

The trial then proceeded as to the one defendant selected by Dr. Taggart and twelve others selected and volunteered by the Alliance in order to secure a series of test cases in which every possible question as to the merits of Dr. Taggart's patents and his claims of infringement, might be finally determined. These test cases are still pending in the District Court at Chicago.

Meanwhile Dr. Taggart took an appeal upon the sole question as to his right to maintain a single suit against dentists collectively. It was upon this one phase of the matter that the Court of Appeals has just rendered its decision.

There is nothing in this decision, therefore, which will prevent Dr. Taggart commencing separate suits against individual dentists.

The officers of the Alliance hope to raise funds sufficient to make a thoroughgoing defense of the "test cases" now pending, so that the merits of Dr. Taggart's contentions may be finally and conclusively settled.

In the United States Circuit Court of Appeals for the Seventh Circuit.

No. 2306. January Session, October Term, 1915.

William H. Taggart, appellant, vs. M. D. K. Bremmer, et al., appellees. Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Before Kohlsaat and Mack, Cir. JJ., and Anderson, D. J.

The bill in this case sets up the ownership of complainant, as patentee, of four patents, viz., patent No. 865,823, granted September 10, 1907, for apparatus for making molds for the casting of dental fillings and the like; patent No. 872,978, granted December 3, 1907, for method for making molds for dental inlays and the like; patent No. 983,579, granted February 7, 1911, for making dental inlay fillings and the like; and patent No. 983,580, granted February 7, 1911, for apparatus for making castings. It charges certain individuals by name, and several hundred others, members of a dentists' mutual protective alliance, an organization of dentists and others formed to protect each other against complainant—some residents and others non-residents of the Northern District of Illinois, whose names are in said proceedings afterwards set out—with infringement of some one or more claims of one or more of said patents, in the following language:

"Your orator further shows that each of the contributors to said fund is an infringer of your orator's patents, this charge being based, first, upon the fact that from widespread investigation your orator is convinced that all dentists not licensed under said patents are infringing them, and, second, upon the fact that contributions to such fund are wholly useless and of no personal benefit to the contributor unless he is infringing.

"Your orator further shows that the infringement of all dentists is of the following character, to wit:

"All dentists make the pattern for casting the inlay as set forth in patent No. 872,978, in identically the same way. They all make the molds in the same way, excepting that in many cases the investment is not placed about the pattern in two layers. Therefore, your orator says that all unlicensed dentists infringe claims 1, 2, 3, 4, 8, 9, 10, 11 and 12 of said patent No. 872,978, while a considerable percentage infringe the remaining claims thereof.

"In making the mold all dentists employ a flask cover and sprue-former, generally like those of patent 865,823. In some cases the sprue-former is not removable from the cover, but in nearly all cases it is. All dentists, therefore, infringe claims 1, 3 and 7 of patent No. 865,823, and nearly all dentists infringe claims 1, 2, 3, 4, 7 and 9 of said patent, while a relatively small number infringe the remaining claims thereof.

"The mold when complete is identical with that shown and claimed in patent 983,580 in all cases, and all dentists, therefore, infringe claims 13 to 17 inclusive of said patent.

"All dentists employ the mold when made for casting dental inlay fillings which are cast entire from molten metal, and when complete are throughout of the same composition, and all dentists infringe claims 4 to

13 inclusive of patent 983,579 covering broadly the method of making fillings, which consists in casting them entire from molten metal and the complete inlay filling and also claims 17 and 18 of patent 983, 580, covering broadly the apparatus used.

"The principal difference between the infringing acts of the various dentists lies in variations of procedure for forcing the molten metal into the mold when complete. The several methods commonly employed for this purpose divide the dentists into a relatively small number of classes, some of whom infringe more extensively than others.

"There is a relatively small proportion of dentists who employ centrifugal force for causing the metal to enter the mold-cavity. It is not charged that these dentists infringe other claims than those hereinbefore specified.

"It is, however, far more common to employ some form of gaseous pressure for forcing the molten metal into the mold-cavity, and all the dentists who use such pressure infringe in addition to the claims hereinbefore specified, claims 1 and 2 of patent 983,579.

"A considerable percentage of those who use gaseous pressure use what are known as 'suction' machines, the gaseous pressure used being that of the atmosphere, which is brought into operation by exhausting the air from the interior of the mold by suction applied from below. The use of such machines is not charged to infringe any further claims than those hereinabove enumerated. The majority of dentists, however, employ one of several forms of pressure devices in which gas pressure above that of the atmosphere is applied to the top of the mold. This gas pressure is secured in some cases by substantially the means shown in your orator's machine, patent No. 983,580, and, in others, by applying to the top of the mold a pad of wet asbestos, wet clay, or clay moistened with glycerine, the heat of the molten metal generating vapor which produces the desired pressure. All of these pressure machines or devices when used, in addition to the claims hereinabove enumerated, infringe claim 3 of patent 983,579, and claims 19 and 20 of patent 983,580. A relatively small number of dentists infringe one or another of the remaining claims of your orator's machine patent 983,580."

The bill alleges, further, that all four of said patents were sustained by the trial court in the Northern District of Illinois, in Taggart v. Moll, case No. 30,850. It further alleges that by reason of the great number of infringements it would be physically impossible to bring and try infringement suits against each infringer separately before the patents would expire; that the cost of individual suits would be practically prohibitive; that complainant's prima facie case was presented in the Moll case within fifteen minutes' time: that the infringers can be readily divided into a small number of groups which can be considered together much more easily than if the suits were tried separately, and that, unless the suits can be consolidated, complainant cannot obtain justice; that defendants, by forming said alliance, interfere with the making of settlements because the several defendants were thereby led to believe that the claims could be defeated or the infringement negatived. The bill therefore asks to be allowed to combine defendants in one suit.

The answers deny validity and infringement, charge that the Moll suit was not well conducted, set out that patent No. 872,978, for the process of making patterns and molds, etc., was held invalid by the Court of Appeals for the District of Columbia, February 25, 1912, in the case of Boynton v. Taggart; deny that any of the persons constituting the Dental Mutual Protective Alliance is an infringer, and deny that all dentists are infringers of any of the claims of patents Nos. 872,978, 865,823, 983,580 or 983,579. The answers also deny all knowledge of the method of forcing the metal into the mold-cavity, and aver that the bill is multifarious, since the bill sets up no joint use of the patents in suit nor concert of action between the several defendants with regard to the patents, and no conspiracy between them. The answers further set up the pendency of the eight suits upon said patents in said District Court, and claim that said patents are null and void because of reasons there stated, including public use, abandonment, licenses, etc., etc.

The District Court issued a preliminary injunction subject to certain exceptions. Thereafter, the cause coming on to be heard before another judge upon the objection pleaded in the answer, viz., that there was a misjoinder of parties defendant and of separate and independent causes of action, the court ordered the bill to be dismissed as being multifarious for the reasons stated, at complainant's cost as to all parties save one. The decree further finds that the "plaintiff and, the court consenting, the following named defendants, to-wit: M. D. K. Bremner, T. B. S. Wallace, J. C. Mackinson, J. J. Bing, M. A. Casill, W. F. Stone, D. G. Marks, D. S. Johnson, Henry Baumgarth, B. L. Applegate, Geo. C. Brady, E. L. Heyne and C. L. Lind elect to waive their privilege to be dismissed from this suit under the order of the court herein, consenting that the several separate causes of action against them stated and set forth in the bill of complaint herein may be consolidated and tried in the above entitled suit upon the answers and other proceedings and pleadings heretofore filed and had in said suit." Exceptions were duly taken, and this appeal perfected.

The errors assigned are that the court erred (1) in dismissing the bill of complaint as to the defendants designated in said order; (2) in dissolving and discontinuing, as to certain defendants, the injunction which had theretobefore been granted against those defendants; and (3) in denying the perpetual injunction as prayed in the bill.

Kohlsaat, Circuit Judge, delivered the opinion.

The subject matter of the present suit is one within the jurisdiction of the federal courts and subject to the provisions of federal equity rule 26. By reference to the rule it appears that the main object thereof is to promote the convenient administration of justice. "If it appear," the rule concludes, "that any such causes of action cannot be conveniently disposed of together, the court may order separate trials." We are therefore called upon to hold that the trial judge abused his discretion in denying to appellant the right to join the whole dental profession in one suit. Whatever may have been the practice prior to the adoption of the rule, the latter must and does control so far as it is applicable.

The grounds upon which the appellant seeks to justify the joinder of several hundred defendants with varying defenses, in one bill, are (1) that the patents in suit have been sustained—Taggart v. Moll, suit No. 30,850, in the District Court from which this cause is appealed; (2) that the issues affecting validity of the patents in suit are identical in the cases of all the defendants and would require but little time in presentation; (3) that these, together with answers to interrogatories presented in accordance with equity rule 58, would make out a prima facie case of infringement; (4) that defendants have banded together and contributed funds to defeat appellant's claim of infringement; (5) that it will be physically impossible for the court to try all the cases where infringement is charged, before the expiration of the patent; (6) that appellant is financially unable to undertake to try said causes separately, and (7) that unless he can proceed to join the multitude of infringers in one suit he will not be able to obtain justice.

These matters were considered by the court. On the other hand, no attempt is made to claim joint infringement by the defendants, appellees herein. They are charged with being separate, independent, tort feasors, all trespassing on the same property, but without any consort, confederation or joint share in the proceeds. One of the patents in suit has been defeated in another jurisdiction, where the patent for making patterns and molds as aforesaid was held invalid. While the issues affecting validity of the patents in suit are substantially identical with regard to each of the defendants, no defendant is charged with any particular infringement for which such party is in said bill sought to be held; the defenses are concededly distinct, and some of the defendants are not even dentists, so that the general charge that all dentists infringe cannot apply to them. The mere joining in the Dental Mutual Protective Alliance and paying dues did not constitute the members of said alliance infringers. It may well be doubted whether the joining of these defendants, appellees, in one suit, would in any way expedite the hearing upon each of said alleged infringements. A complete record would be required in each. The fact that the profits and damages in each case if successful would be small, while a large expense would be incurred in each case if tried separately, cannot be deemed controlling. There are and have been in the past many cases in like situation.

Courts are instituted for the purpose of establishing rights. Once these are settled the rest, it may be assumed, will follow. But the most startling result of appellant's proposed course would be the opening of the courts to a scheme for dragging a multitude of alleged infringers into threatened expensive litigation in a single proceeding whereby settlements would be submitted to rather than endure the worry and cost of litigation. It is difficult to see how anything but confusion and injustice to the many could result. Having these matters in mind, was it an unreasonable exercise of the discretion conferred upon the court by statute to order said bill to be dismissed at appellant's costs as to all of the defendants save one? We think not.

Thus giving to equity rule 26 the most liberal construction possible, we fail to find any abuse of the discretion therein conferred upon the trial judge. We are of the opinion that the rule was adopted in the interest of simplified procedure, but that, as in the prior adjudications upon multifariousness, misjoinder and those of like nature, the application must depend largely upon the circumstances of each particular case, and rest in the sound discretion of the judge.

We find no error in the action of the court upon any of the matters assigned for error. The decree of the District Court is therefore affirmed.

A true copy. Teste.

Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.

COLLEGE COMMENCEMENTS

UNIVERSITY OF BUFFALO, COLLEGE OF DENTISTRY.

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February 5, 1916—J. R. Adams, J. H. Alexander, G. W. Hall, O. A. Noland, V. F. Schoppe, W. E. Skala, G. W. Svoboda, W. G. Swekosky, C. S. Todd, E. V. Todd.

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OBITUARY.

DR. F. H. STAFFORD.

Dr. F. H. Stafford was killed June 24th, 1916, by being crushed between a street car and an auto truck near his office in Chicago. He was born in Ohio, June 2nd, 1866, graduated from the American Dental College, March 24th, 1891, later from the Northwestern University Dental College, in 1892. He took two courses.

In his profession he was an inventive genius, and possibly overconscientious in his efforts, forgetting his own physical self and the commercial side in his effort to do conscientious work. He enjoyed his work and leaves a large clinetele to regret his departure.

As a man, he was a Christian of a very pronounced type, and never lost the opportunity to suggest the possibilities of religion as a panacea for our troubles. As a friend he was loyal.

As a husband and father, he was true and faithful, his highest ambition being to have a Christian home. We, as a profession, part from him with memories of love and kindness, grateful in our hearts that his life was a part of qurs.

Dr. Stafford leaves a wife and boy, to whom our sympathy is extended.

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VINCENT INFECTION.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO, ILL.

The importance of early diagnosis of infection from Vincent's Spirillum and Fusiform Bacillus has in my own limited experience been demonstrated to me on several occasions and in the hope of impressing you gentlemen with the need of bacteriological study and investigation upon visible signs of active inflammatory processes or any pus excreting condition of the oral cavity I bring this vicious form of infection to your consideration. I fear that many practitioners are in the habit of treating as an ordinary alveolitis any and practically all pus conditions of the gingivae. One of the cases above referred to had thus been treated for a condition which in reality did not exist at all, for a period of seven months, namely for a case of alveolitis. The different dentists who had this case in hand at various times had diagnosed and treated it as such, with the result that the patient went from bad to worse and finally came under the care of a dental practitioner who felt that the condition was something out of the ordinary and happened to refer the case to me for diagnosis. At that time the glands under the mandible and in the back of the neck were already involved and considerably swollen and painful. The case was diagnosed as a Vincent infection but owing to the advanced stage, it was all we could do to save the patient's life (by heroic doses of cacodilate of soda introduced intravenously). Every dentist upon the presentation of any pus case of the gingivae or oral mucous membrane should at once make a smear of the material and examine it microscopically, or at least have it done by some one else if he is not in a position to undertake it himself, in order to determine beyond any doubt whether the contents of the discharge harbor merely the ordinary bacteria which we are accustomed to find in the oral cavity or whether it contains strange pathogenic organisms or strange saprophites. Anyone (even though he be equipped with but slight knowledge of bacteriology) can determine such preliminary, necessary findings, and right here allow me to dwell, even if only momentarily, on the advisability of making a direct smear previous to proceeding to the making of any cultural examinations for the recovery of the organism in pure culture. Of course, it is well known to all of you that certain organisms do not grow well on certain media and again that others must be in more or less perfect symbiosis to each other if they are expected to develop properly together in the same culture. It will be found most likely however that they are *not* in symbiosis and therefore will crowd each other out in the process of artificial cultivation. If then one of the organisms originally present be crowded out by one of the others in the mixed inoculation placed on the artificial media, it is quite possible that the organism will be the very one that is doing the damage and in that case your diagnosis if based on the examination of the growth obtained from the artificially grown culture will certainly be faulty. If a direct smear is first obtained, however, it can usually readily be determined if any certain species of organisms for such a pathological picture as you may find in the case is present or not and you can also readily notice the preponderance of any one species over any other, then if found necessary the offending organism can be grown in pure culture by proper cultivating methods. So you can readily see that if the whole mixture of organisms be taken from the pus direct and planted on any ordinary media it is as likely as not that the lack of symbiosis or the improperly selected media or the method of cultivation adopted may prevent the growth of the very organism that is doing the harm and give you an entirely wrong impression. A preliminary smear is made in all of my cases. Thus the cultures on blood agar slants and plates in the cases above referred to showed only pneumococci and streptococci (both hemolitic and viridens), which would have been most deceiving, but the direct smears of the pus showed prolific Vincent spirillum and the bacillus fusiformis. The visual signs in the mouth were sores very akin to those usually found in infections from Vincent angina, namely large ulcertating patches covered by a yellow scab and in one of these cases a deep ulcerating process going down between the teeth exposing the margins of the alveoli around all the lower anterior teeth. This ulcer covered an area of about an inch and a half in length and about one-quarter of an inch in width. The deeper invasions of the ulcer between the teeth lent an expression to the ulcerative process resembling in many respects ordinary alveolitis pockets. The interstices between the teeth were filled with a thick yellow greenish pus. Wherever this pus or the encrustment over the ulcer was removed it left a bleeding surface. Such surface remained ulcerated. There was no disagreeable odor from the mouth and saprophytic organisms were excluded from the findings. The glands under the mandible were somewhat enlarged. There was marked prostration and extreme sensitiveness to the necks of the teeth covered by pus. These ulcerations are known at times to keep up for months without producing the final invasion into any of the adjacent glandular structures, however, these do finally become infected if the process is not stopped before that stage is reached, as in one of these cases the tremendous infection of the parotid gland almost resulted fatally. The organisms found in the smears or from cultural findings can be demonstrated by Gram's iodin stain; they are Gram negative but are nevertheless shown quite plainly by means of the Gram method. They show purplish pink in color in contrast to coexisting Gram positive cocci and bacilli and if really a Vincent infection, always will show the two organisms together, namely the spirillum Vincenti and the bacillus fusiformis. In 1882 Miller described a fusiform bacillus that occurred in small ulcers between the teeth and the gums and also in cavities of carious human teeth. In 1884 Cornic and Bach described a fusiform bacillus growing in a necrotic exudation from a pseudomembranous diphtherialphargyngitis in school children. The same organisms were found by Lammerhirst, Vincent, Miller and Plant, and again later were demonstrated in the pus of an ulcerating antral empyemia. It would seem, therefore, that these fusiform bacilli are to be found in *various* necrotic processes. Plant and Vincent found that in the necrotic ulcerative conditions where this fusiform bacillus was seen another variety of bacterium in the shape of a spirillum was found, existing in perfect symbiosis and this was named the Vincent Spirillum. These spiral forms did not take the stain as well as did the bacilli, but nevertheless once you know how to look for them they are easily seen. They were of unequal length, appeared less corkscrew shaped and were more serpentine than the spirilla forms recognized up to that time; one-half to one micron thick by about twenty to forty microns in length—very long and slender with from one to twenty shallow, long indulating curves. In all cases the two organisms appeared jointly. Vincent after much investigation concluded that the *spirilla* and not the *baccillary* forms were the responsible causative organisms for the angina. However, the relationship of the organisms to each other and to the morbid conditions was long under debate. None of these investigators was able to cultivate either of the organisms artificially. The greatest amount of research work as to cultivation methods was probably done by Tunnicliff. After much hard work she was finally able to grow the fusiform bacillus artificially in pure culture, and she also soon found that from these cultures the spiral forms shortly afterwards became visible. This proved that the two organisms were really one and the same only in different stages of development, at least that is the interpretation she gave to her findings. McFarland is not ready at this writing to agree as to which of the organisms has priority with reference to development. The bacillus fusiform is cultivatable on ascitic agar in proportion of 1 to 3 under strictly anaerobic conditions at 37°. The colonies appear after two or three days as greyish white patches from 0.5 to 2 mm. in diameter resembling very much colonies of streptococci. By transplantation then the pure colonies of bac. fusiform were grown and appeared as pure whitish colonies. It seems beyond the province of my efforts this evening to describe the results of transplantation on various media, but I might say that no matter on what media the bac. fusiform is grown, it seems to present the same appearance. It measures from three to five mm. in length by 0.3 to 0.8 mm. in thickness. The organism is thickest in the center and tapers off to rather a point at each end. They can readily be stained with Loefflers alkaline methylene blue, fuchsin and by Grams or Giesmas methods as well. In respect of staining qualities the fusiform bacillus is apt to be mistaken for diphtheria bacillus owing to the uneven manner in which the stain is taken up, the organisms seem to be divided into parts as is seen in the stained diphtheria bacilli. However, it is much longer and more slender and once acquainted with it it is easily recognized. The endospores which these organisms occasionally appear to form, are in the center or they may be at either or both ends. After twenty-four or forty-eight hours of further propagation filaments are noticed, they are of the same diameter and contain deeply stained bodies round, as well as in bands. Upon a further delay of four or five days the spiral forms appear and are produced in enormous numbers. These stain uniformly, although occasionally some show dark bodies previously seen in the bacillary forms. The spirals occur in uniform turns of about one to twenty in number. Neither of the organisms show flagellae or movement in hanging drop specimens. As to pathogenesis while it has been shown that pure cultures of the organisms can be injected into guinea-pigs without result the conditions resulting from these organisms in human beings at times present most alarming symptoms and occasionally fatal results. Whether these virulent states of the organisms be due to the concommitant growth and influence of streptococcus or pneumococcus in association or not, has not been fully determined, but is a factor well worthy to be kept in mind, as we know full well, that the coexistence of other than the causative organisms in various diseased conditions do frequently alter the pathogenicity of the causative organisms very materially. Patients suffering from Vincent infections are very emaciated, the glands in adjacent territories become involved and at times metastatic infections and abscesses are produced. General septic conditions may result and are sometimes fatal.

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*Read before the Odontological Society of Chicago, April 4, 1916.

A word of caution to those contemplating the examination of direct smears from the mouth with reference to the proper identification of those organisms may not be amiss, and may also throw some light on the proper identification of the various types of treponema occurring in the oral cavity. You are probably already familiar with the fact that Noguche mentions besides the spirocheta mucosa three other types of treponema commonly found on the oral mucus membrane. Of these three the largest and thickest with only a few flat curves is the spirocheta buccalis. The second and third types are more delicate in structure, possess a thin flexible body and have closely set shallow curves, the only difference between the latter two being their respective size. The medium form of these three which is considerably smaller than the buccalis type mentioned before, bears no particular name and is simply known as the medium form of the spirocheta dentium. Noguche has done more work on these spirochetes than any other investigator, he has developed and in fact discovered the smaller of the two latter types and in order to designate them in speaking of them individually he has named the larger treponema macrodentium and the smaller treponema microdentium. There is no danger whatever of confusing these with the Vincent organisms in smears, however, first because in ordinary staining methods (that is excepting Giesmas stain) they don't show at all and secondly because of their much smaller size and difference in thickness and curves. The treponema microdentium is usually found at the juncture of the gingivae with the necks of the teeth, and also in cavities of carious teeth, while the macrodentium is more apt to be located in the mucosa of the tonsils and pharynx and also in large numbers in ulcerative stomatitis. I shall not devote any time here to the cultivative differences of the various spirochetes as their description can be found in most any textbook on the subject. If after having studied the various types you should at any time be in doubt over the proper differentiation of these types of organisms the cultural differences will clear up the matter for you, but let me add here that these cultural methods for the different treponemas are beset with many difficulties and to propagate them is a very difficult procedure. It is not at all likely that the appearance of the treponema mucosum so commonly found in cases of alveolitis will be mistaken for anything else, as its appearance is quite characteristic. It is the organism which is responsible for the peculiar odor in these cases and Noguche thinks it is quite likely to be the causative organism of alveolitis. The morbid processes found in connection with Vincent spirillum and fusiform bacilli are by many not supposed to be produced by these organisms per se, but they believe that these conditions in simpler forms may be started by these germs (or even that is in dispute) however, they do believe that the conditions are greatly aggravated by their presence in association with such other organisms as streptococci and pneumococci. From the studies I have made with reference to the virulency of the combined Vincent organisms I am of the belief that whenever the pneuomococcus (in numbers) is found in association with the Vincent organisms and the clinical picture is that of a Vincent infection we are entitled to the belief that we are dealing with the Vincent organisms in a *virulent* state. A further result of my investigations is that wherever I found a state of virulent and gross infection of Vincent I also found the fusiform bacillus in *very great numbers,* very different from the microscopic picture ordinarily obtained when the organisms are merely present in an *avirulent* state.

These bacteria then while they are classified under pathogenic germs are frequently found in a non-virulent form, in perfectly healthy mouths, the same as streptococci and pneumococci are found in that state, but they may assume a truly pathogenic character and then are indeed dangerous organisms to have about. The question which arises with infections of this type is when are we permitted to say, or how are we to determine when these organisms are to be blamed for the ulcerative conditions? I would answer that query by saying from what I have found in my studies, that when the clinical picture presented leads us to suspect a Vincent infection and we find both organisms the Vincent spirillum and the fusiform bacillus present, and the fusiform bacillus in tremendous numbers, particularly if these organisms are found in association with streptococcus or pneumococcus or both, then I feel that we are entitled to the conclusion that the condition is one of a true Vincent infection. If then on planting out anaerobically or by planting the mixed organisms on human blood agar and growing such a culture anaerobically for 48 hours we obtain a pure luxuriant growth of the pneumococcus or the streptococcus or both, we have to my mind a still further corroboration of these findings as being positive for *virulent* Vincent. I should only recommend the well known medical treatment for these infections in such cases, namely the use of Salvarsan or the intravenous injection of cacodylate of soda in large doses. Whenever that treatment is utilized you will find that the first few injections have seemingly very slight influence on the local picture but that after a number of injections have been made the whole condition seems to clear up spontaneously, just as though it had required the cumulative action of the drug used.

A FEW PHILOSOPHICAL THOUGHTS ON THE CONDITION PYORRHEA.*

BY DR. MALCOLM ROBB, ST. LOUIS, MO.

It must seem to you a little audacious on my part to attempt to talk on a subject which has been so thoroughly investigated and so ably presented to this society and the rest of the country by the brightest minds in the dental and medical professions. I should be, metaphorically speaking, sitting at their feet and drinking in the words of wisdom which fall from their lips. I *have* done exactly that but added to it a little "watchful waiting" for I feel the profession has been guilty of too much faddism in the past fifteen years or so. Let some man, prominent in the profession, say so and so is the correct thing to do and the poor public has no escape and the professional brother who dares to hold back is branded "Not up to date."

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*Read before the St. Louis Dental Society, June 6th, 1916.

We have had scientific investigations and scientific investigations and as yet have reached no where. No discredit to the investigations, however. It makes me think of Omar Khayyam's gropings when he says "Myself when young did eagerly frequent Doctor and Saint and heard great argument but evermore came out by that same door wherein I went."

It has the appearance of running down various lanes and finding we are in a blind alley. If so many bright minds have run their heads against a brick wall, why should not a poor obscure member of the profession have his little fling into the realm of the unknown? If I come up suddenly with a bump it will probably be "solo" for I have not enough weight to start an avalanche.

The results of investigations to which we have paid heed have been from the exact methods of science, but I am going to try to look at it from an entirely different angle, from the realm of the speculative, as it is termed.

The truly scientific mind does not accept anything but what is easily demonstrated to the five senses, and that is absolutely correct while after some material fact, but the tendency is to remain too close to the immediate antecedent. L. H. Grindon—"Life"—"Every cause is itself only the effect of a still finer cause, which again results from a yet finer, no longer physical, necessarily, and the whole chain, from beginning to end, must be considered if we would acquire a just notion of the last effect."

Now, frequently the immediate cause of many diseases is considered bacterial, or some other form of microscopic life, whereas the *real* cause may be very remote from them and they are probably merely concomitant.

Suppose we have a lot of water in a reservoir with mains and pipes leading down from it. The water remains in that reservoir until we open some cock, when the laws which govern physical objects acts, and the water runs out. To prevent our homes, say, from being flooded or washed away, we do not spend our time and energies carrying or sweeping the water away, but shut off the cock.

This may not be a very good simile but it does look as if we were wasting our energies making a frontal attack upon a form of life which is probably merely following the line of least resistance and very likely would not molest us if we did not give it a chance. This phrase of least, or lowered resistance, is quite a pet phrase in the profession. If it is the lowered resistance which allows the entrance of bacteria into an area, is not there a way to raise the bars and exclude them? Of course I understand that we find individuals so far down and out that we must first clear away these exotic irritants and destroyers before we can raise the bars, but my contention is that we, as a class, end there, saying that nature will do the rest.

Nature, what is nature? Ask that question of most of your acquaintances and catalogue the answers.

If some of our bright minds would only study the larger scheme of things, things which probably could not be demonstrated to the five senses in a laboratory, but just as real and far more important, and then give us a formula for correct action, I believe we could more readily cure these ills that flesh is heir to.

Gulielmo Ferrero, one of the very fine modern historians, in his work "Ancient Rome and Modern America" gives us food for thought. He shows us the workings of nature even if he does not go back to first causes.

This work is written to show the similarity of social life in Modern America with the social conditions in Rome at the pinnacle of its greatness. At the moment of Rome's greatness he says the disease, which finally caused its ruin, was well developed, and that condition exists in America today.

Rome's greatness in arms brought expansion in commerce which again caused wealth. With wealth came ostentation. Everybody vied with his neighbor in spending for effect's sake or for popularity. Wealth was most noticeable in the towns and the towns became attractive. The bright lights and extravagant living attracted those residing in the country to the towns and the towns grew to cities. The cities grew until the country-side was depleted of its population to such an extent that there were not enough left to feed the cities.

The usual results followed, high cost of living, etc., with all that that means.

"Excessive Urbanization" is the name he gave this destructive disease. He says the empire drew its soldiers from the countryside, but when the country drained into the cities they could get no more soldiers, for the extravagance, luxury and ease of city life did not develop men. The decadence and degeneracy left them a prey to external forces and internal disease.

Without a great deal of straining of the imagination we can see a great similarity between Rome and our present conditions. In the last twenty-five years the country has become wealthy by leaps and bounds. Prosperity has come to all classes from laborer to frenzied financier, with the result that all are living in more ease and luxury.

We, also, have been piling into cities, huddling into tenements, both cheap and high priced, and spending our time digging for money. In all our luxurious living we have neglected our physical beings.

Analyze what is usually termed "good living." Probably the first thing we do after acquiring some wealth is to wear better clothes made of softer material, which reduces the necessity of our skins to resist harsh contacts. Handsomer garments suggest care of them, which means reduced movements. Watch a person with either new clothes or their "very best" on and you will see them bend slowly and carefully in the act of sitting, for instance, and then slowly and daintily pull up trousers or arrange skirts. Etiquette of good society demands dignity which is statuesque and far from invigorating. After raiment comes a better home, even to the height of refined living, as I have heard it expressed—apartment and hotel life. Luxurious furniture in such homes is not suggestive of much violent physical exertion. The telephone has eliminated the errand for the bulk of the populace. The street-car and automobile get us from place to place with practically no exertion. Even etiquette of the table prohibits us making much movement of our jaws in the act of masticating. And so on down the line. No physical exertion is made if it is possible to avoid it.

I do not think it takes much of an argument to prove that real health of mind and body comes from vigorous exercise of both. Yet we invariably shun it. If that is true of the body as a whole it is just as true of any particular part of the body, for the whole is made up of parts.

You might argue that exercise is destructive, wearing out the part, just as happens under the law of mechanics. But we know that exercise makes strong and not weak. What is the law that governs it and why are the results as we find them?

Swedenborg says the law of life is "use." He has two laws which explain the whole rationale of existence—that is, existence on this plane—the Law of Correspondence and the Law of Use.

The Law of Correspondence, broadly stated, is the law of cause and effect.

The Law of Use instructs us as to the particular ends for which the various objects of creation have been designed, and the necessity for every one of them.

Now, if every object was created for a particular end, or use, the more it performs that use correctly the more life will flow through it and the more capable will it become to perform its function in an uninterrupted state. In an ideal condition of existence with everything performing the use for which it was created there could be no accidents in nature, for everything would be exhibiting life to its fullest capacity and resisting all effort of interference.

Therefore, if resistance to outside evil influences will keep an organism normal and resistance is acquired by a healthy use of the object, then put everything to work and thereby have not only prevention but in many cases actual cure from disease.

Twenty-five years ago, when I entered college, "Riggs Disease" was listed among the ailments we would possibly be called upon to treat, but very little was ever said upon the subject and practically nothing taught about it at college.

Whether it was not as prevalent then as now or whether my restricted field for observation, due to my small practice for a few years, made it appear so, I am not going to try to prove. I, at least, judged it so and did my philosophizing from that premise.

Living in a boarding house for a number of years, I had a splendid opportunity for studying people at meals. I had a great desire to perfect myself in prosthetics, so watched everybody I could in the act of masticating to see what movements were actually made. It did not take long to discover that very little movement was made at all. Indigestion was the first thought I had, but little by little it dawned upon me that this fact might be a contributing factor in "Riggs Disease," which seemed to be on the increase. I figured the disease to be an exhibition of degeneracy—atrophy.

Up to twelve years ago I treated pyorrhea according to the usually prescribed methods. At that time a patient of mine brought in a lady, her cousin, whose home was in Kansas. She explained how her dentist had been working for some years trying to help the pyorrheal condition, but it had grown steadily worse until he had finally advised removing all her teeth and inserting full artificial dentures. My patient was very anxious that I make an effort to save the teeth but I could not see how I could benefit her more than did her home dentist. I examined them, however, and found them in a very bad condition. Pus could be expressed from around almost every tooth and they were very loose. About half the root was exposed, so I did not see how they would ever be made firm again. I told her I agreed with her dentist, and advised her to return and have him finish the work as he had expected. My patient would not hear to it, and insisted I make the effort. Why she wanted me to try I do not know, for I had failed with her own case and she was wearing plates herself. I finally consented to make the effort and determined to try this new idea which I had been reasoning about for some time.

All deposits were removed and the roots polished to the best of my ability in the short time I had. In trying out this idea I did not want to mix methods, so during the whole treatment I used no medicament whatever. Nothing but plain hydrant water entered her mouth.

The moment I started with her I had her take plenty of exercise. When the preparation of the roots was completed my instructions were to brush the teeth with a hard brush, using the movements I showed her; to get a few boxes of Dr. Thomas' uncooked bread and eat at least one wafer at each meal, using all the effort possible in the act of masticating. She was to continue her general exercise, taking plenty, and using effort in whatever she did. I prescribed no mouth wash, my whole idea being to create vigor generally and locally.

I was a little fearful I would not get ideal results, as two or three teeth were missing at different parts of the arches, which left the teeth on either side of the openings unsupported.

She had a pass on the railroads, as her husband was a lawyer for one of them, so I told her to return the last of October, this treatment being the first of September.

When she returned there was one tooth only which needed attention, all the deposit had not been removed and there was a slight inflammation around it. I corrected that and sent her home until toward the end of the year. She returned on the last day of the year. Her teeth were firm and the gums hard and snug around the teeth, with absolutely no sign of pus, and she looked in fine health. She said that at first to eat as I had instructed her was as bad as the ancient form of penance of putting peas into the shoes, but she persevered until masticating was no longer a discomfort.

She reported once a year for three years, then she disappeared. During that time I found no occasion to do more than clean the teeth superficially. Her mouth was a perfectly normal one—gums firm, teeth tight and no deposit.

A year and a half ago she turned up again with her teeth beginning to loosen and the gums spongy. I could find no pus but there was some deposit. She said she had become careless after she ceased coming here and the trouble returned but not so badly as formerly. She had become wealthy and a widow and spent most of her time traveling around the country, living in hotels, of course, and renouncing her life of vigor both generally and locally. She had taken a treatment for the returning condition in one of the eastern cities, but the benefits were of short duration, she said. A couple more teeth had been lost, so it was necessary to do some bridgework to give her the full use of her mouth. That fall I did no more than get the teeth firm again and the following spring did the bridgework. Last fall and last winter she reported and her mouth seemed perfectly normal once more.

The great difficulty is to keep the patients up to vigor. While they are under your influence you may get results with some, but the moment they are from under your care they lapse into their easy and lazy ways. It is not always entirely their fault, for with the culinary arts developed to the present high point of perfection it is very difficult to get anything of sufficient resistance to exercise the teeth or massage the gums. Of course, the lack of general exercise is pure laziness.

Here is a case which is very much to the point in which results were gained by natural methods instead of artificial. This lady I had taken care of for a few years before pyorrhea showed itself. The first indication was lack of tone in the gums, then engorgement and easy bleeding, and finally pockets and pus. I went through the usual story and efforts, with but very temporary benefit. Every three or four months she would come back and I would have to go through the whole thing again. Whenever she would present herself I could see plain evidences of carelessness but she denied it flatly. There is a line, of course, beyond which we do not dare to go in our endeavors to force our point, and that line was reached long before any real beneficial results were obtained.

On one of her visits she announced she was going to Europe to perfect herself in the German language and would be away for two years. She seemed to dread the idea of falling into the hands of a foreign dentist and she wanted me to do something magical which would carry her over the time until her return to America. Of course I took this opportunity to preach, but she insisted she had done everything I had told her to do.

Well, she departed and I did not see anything of her for a little over two years, when she appeared in my office without any notification. As soon as I had the opportunity I examined her mouth, expecting to find a wreck, but a more perfect mouth I have hardly seen.

The history of her stay over there convinced me all the more that if we could only get the co-operation of the public we could find an easy solution of this awful disease.

In order to learn to think in the language it was necessary to be where she would hear no English, so she selected a little village in the mountainous district off the beaten path of the tourists. She boarded in the home of one of the peasants and, of course, ate their fare. If she wanted to go anywhere she had to walk, for there was no form of conveyance to take, and the country being mountainous, every little errand meant effort. As the people lived mostly out of doors, she found herself doing the same thing. The foods were simple and simply prepared. The breads were made from the whole grains ground and required the use of the teeth to get it to the swallowing consistency. There was no pre-masticated or pre-digested foods and practically no highly seasoned dishes. Her whole life was necessarily a vigorous one, as every movement almost required some physical exertion.

She naturally forgot all about her mouth and did not again think of it until she sighted New York, when her previous condition came to her in a rush. She was so fearful of some dire consequences due to her neglect that she shortened her stay in New York materially and rushed home and straight up to my office. She claimed nothing appeased her appetite since her return, no matter how much she ate, and she had sought everywhere for flour as it was made where she had stayed, but to no avail.

Six months after her return home she called again and her mouth was as bad as the day she left for Europe. She has since lost a couple of teeth. Are there more germs in America than Europe?

I remember a gentleman with a rather stubborn case, but with only a few teeth affected, who claimed he lived strictly up to my instructions. I believe he did, spasmodically, judging by the appearance of his mouth at his various visits. One time he was down south at his usual winter resting place when one of his pet teeth flared up. He took the first train to St. Louis and appeared in my office about eleven thirty. He wanted to know when I could see him, so I fixed the first thing after returning from lunch. He started off, but in a few minutes returned and said I was too slippery an individual, so the best way to be sure he could get in was to keep me with him, so he invited me to go to lunch with him. I did not want to waste the time, as I knew I would have to, by going to the place where he would eat, but I thought this a good opportunity to watch him and see his methods, so I accepted. I threw the ordering on to him, not expressing a preference except in one instance. Everything he ordered was of the softest, and when it came to eating bread he took that which had very little crust and left even that little. He had finished his dinner before I was one-third through, and when we had left the hotel I called his attention to these facts. He denied it at first but finally was convinced that he had not been living up to my instructions.

There is another class much harder to handle even than this last one. These come into your office and demand treatment and do not want you to prescribe anything for them. They tell you to cure them and they will pay the bill. They are too busy with their own affairs to help you out. Your business is to cure and theirs is to pay. These are not necessarily their verbal expressions but it is their attitude and we might as well tell them in the beginning we can do them no good.

In the early cases, as I explained, I used no medicament at all in trying out my theory, but in most cases today I use some drug, either simple or proprietary. The drug helps but is not necessary in my estimation. P. T. Barnum's estimate of the American public I have had to acknowledge as largely correct. To reach satisfactory results by simple methods would not be accepted, there must be the complex and mysterious in what we do. The man who scratches his head and looks wise and then writes out a prescription for a mouth wash in place of suggesting one already on the market, is quoted to the patient's very end. Therefore, some voodooism must be used in connection with the real treatment in order to accomplish the desired result.

The Life-Extension Institute of New York is preaching somewhat of the same doctrine, only they have gone very carefully into all phases of life and prescribed in detail for them all.

Professor Irving Fisher of Yale University read a paper before the fall meeting of the Eastern Association of Graduates of the Angle School of Orthodontia on the findings of The Life Extension Institute's researches. The publication of his paper is in the April number of the *Dental Cosmos* and should be read by everyone. He says in one place that "the invention of machinery, especially the flouring mills, is largely responsible for the decay of the teeth. We are shirking the work of our own flouring mills. We are shirking the work of crushing our food ourselves." I should like to add to the above that pyorrhea results largely from the same conditions, the lack of the healthy exercise of the parts. Quoting further from Prof. Fisher, "In this country we have emphasized almost explicitly the function of the public health officer and the individual has thought he could delegate his health to the public health officer." Precisely the same attitude is taken in regard to the medical fraternity. The medical world is supposed to keep the rest of the population in health no matter how much the laws of life are broken. They are willing to pay the bill, but don't ask them to do anything, they are too much occupied with their own affairs.

In the March *World's Work* is an article by H. W. Lanier, called "Why Not Be Well," which lends some emphasis to this subject. He also sees our decadence; but one point which appealed to me was how the unmeasurable was the factor which finally caused the cures.

Now, if we are convinced that this decadence is upon us, is there a way to awaken the public consciousness to the fact? I believe there is.

If a few men, for the sake of gain, can make such sheep, and sometimes I feel like using a stronger term, of the public, by dictating what we shall wear, no matter how ridiculous, why cannot society be saved from itself by applying the same law?

The tide of public approval is being set against the medical world and toward any "ism" which promises relief from their ills while permitting them to remain in the condition which caused the discomfort.

The medical fraternity is the proper medium through which the knowledge of correct living should come and if they do not accept the challenge the layman will surely do it, as seems evident even now, and to the disadvantage of the medical world.

Faddism is the "Heel of Achilles." Strike there.

THE TREATMENT OF CHILDREN'S TEETH.*

BY DR. L. B. TORRENCE, CHESTER, ILL.

Mr. President, Ladies and Gentlemen:

When the mass of people fully comprehend that many diseases, which are now regarded as incurable, may be prevented by prophylaxis, then will the problem of the treatment of children's teeth be very much simplified. But until this enlightenment of the people is an accomplished fact, it is the duty of all practitioners of dentistry to meet the conditions as they find them, and meet them bravely, even though you find yourselves the subject of unpleasant criticism, remembering when assailed the words of Cervantes: "The brave man carves out his fortune, and every man is a son of his own works."

I was surprised to learn from your Programme Committee, when invited to write this paper, that the subject of children's teeth had lain dormant before the Illinois State Dental Society for many years. I cannot quite comprehend why this should have been the case, when I take into consideration the great importance of this subject in dentistry.

Children are born into the world with practically the same chances physically, but unfortunately under very different environments. As I read in our daily press of the prodigious donations made by the wealthy men of our country, to our institutions of learning, it often occurs to me that there should be some one among these rich men who would devise some means whereby the environment of the babies and youths of this country would be so improved, that the future manhood and womanhood of our land would be perfect in every detail, morally and physically. And well may we rest assured that the youth of moral and physical perfection will be endowed with such insatiable and unquenchable ambition that his or her attainment in the field of intellectuality will be the balancing factor found to be necessary to the completion of the makeup of the ideal individual.

We as dentists, are but one set of men, of the great aggregation of men who are endeavoring to work out the ideal in civilization; and as the future manhood and womanhood of our great country must spring from the present boys and girls that play around our doorsteps, it is necessary in order to do our share of this uplifting, that we should look after the health and welfare of these upgrowing children.

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*Read before the Illinois State Dental Society, May, 1916.

Henry Ward Beecher said: "Flowers are the sweetest things that God ever made and forgot to put a soul into." I would supplement that statement by saying that the completely healthy child is the sweetest thing that God ever made and put a soul into.

They come to us with smiling faces and laughing eyes, or frowns and tears, the very incarnation of implicit confidence or of total distrust; their position towards us depending entirely upon the information they may have received about dentists and dentistry prior to this first visit. I know of no place where the character and opinion of the parent is so faithfully reproduced as by the child in the dental chair. I hardly think I am an expert in handling children, and yet I find as I grow older in the work, that it becomes less distasteful to me than in the days of yore. I am willing to concede, with the pessimist, that a great deal of our trouble with children is caused by those who accompany them to the dental office, but it is not all to be laid at their door.

The words of Hume apply to the situation exceedingly well: "He is happy whose circumstances suit his temper, but he is more excellent who can suit his temper to any circumstances." In other words, if you cannot suit your temper to the circumstances, then in order to save your reputation and the child's disposition, let the case go to someone who can. I think that nine-tenths of the trouble between the dentist and the child patient is due to the fact that the dentist is completely out of tune with that patient, and fails to find the responsive chord. The other one-tenth of the trouble is because the dentist is imbued with the foolhardy notion that the child should have his or her teeth treated the same as an adult.

Let me illustrate with a case in practice. Suppose a child should come to me with a badly broken down abscessed deciduous molar. I would lift off the decalcified dentin with a sharp spoon excavator and expose the putrescent pulp or pulp chamber, or, on failing to reach the interior of the tooth with this instrument, take a sharp number one-half round bur in the engine and touch the tooth just for an instant, and possibly necessarily again just for an instant, making a small opening. When we have accomplished this the child is at the end of the first sitting. What is the effect of this visit upon the child? He has spent a night of agony previous to his visit to our office, and his father and mother have administered all the known remedies for toothache in the house; he has been told by some other youngster that to visit a dentist is worse than going to hades itself, and now he goes away from our office with the full conviction that all the stories he has heard about dentists and dentistry are simply falsehoods, and he spreads the story broadcast among his fellow child playmates that a visit to a dentist's office is a most pleasant occasion. He is told to return the next day, and he comes back without the unnecessary encumbrance of a solicitous mother or a stern, unreasonable father. On the occasion of his second visit we take a sharp, small-sized fissure bur, and cut away the thin, overhanging covering of dentin which remains over the pulp chamber, and wash out with any of the per oxygen compounds. We do not use these in a syringe, except it be to use the syringe as a dropper. Put a drop or two in the pulp chamber and stir it with a small instrument until the effervescence ceases. If we do not think it clean enough, we take a water syringe and wash away the accumulated debris and repeat the treatment; then put in any of the antiseptic oils on a small piece of loose cotton and dismiss little smiling face, for we are now at the end of the second sitting. By this time my little friend has learned to idolize me. Next day I take out the oil, and syringe out the pulp chamber, making up on my slab a paste composed of thymolized calcium phosphate and formo-cresol, and with a smooth broach I pump this gently up the canals, then fill up the pulp chamber with the same material, (no canal points in this, please) after which I take up the moisture with cotton and seal up with cement that is soft enough to drop in the cavity. If it should happen to be more convenient to me to finish filling this tooth at once with an alloy filling I do so, and dismiss the little bunch of sunshine without any apprehension of a brewing storm, and although that child may not be a poet, I believe he will think at least in the same sense as runs Tennyson's lines: "God bless thee with blessings beyond hope or thought, with blessings which no word can find."

I have now given you, ladies and gentlemen, the treatment of a case which might be said to be typical of many cases received annually in a country office for the services of a dentist. There are many other things that come up in the treatment of children's teeth that should be a matter of close scrutiny and keen observation, especially is this true while the patient is losing the deciduous teeth and erupting the permanent ones. Any system of orthodontia that does not take into consideration the final resting of the grinding teeth upon their proper planes of occlusion is faulty in its foundation, and cannot endure. A perfect occlusion of the teeth means a perfect interlocking of the inclined planes which form the grinding surfaces, so that they are not inclined to move or slide away from their normal position; and is one of the most important things to be looked after while you are treating children's teeth.

There is another case to which I desire to call your attention, and that is when a child comes to you with a crown of a deciduous tooth almost completely gone. In this kind of case I would advise you to fill those roots in the same manner that I have advised, with the exception that I would put into the upper third of these roots a plug of guttapercha to keep the roots in place and hold the space in the child's arch until the time for the eruption of the permanent teeth. Guiding the teeth into place is far better for the nervous system of the child and the purse of the parent than a later case of orthodontia. A fine field is this for prevention. Prevention, that part of dentistry which is so much urged and advocated at the present time. I would recommend in connection with the above thought that you read page 293 of 1906 Transactions of the Illinois State Dental Society, where you will find in a clinic report a simple method introduced to the profession by the author of this paper, for guiding the anterior teeth into proper position.

There often arises in the treatment of children's teeth a seeming deficiency in the development of the jaw. This is more often caused by the crowns of the teeth becoming broken down, and the roots of the teeth closing together, finally forming a smaller arch. This trouble can sometimes be practically overcome by packing the proximal cavities that occur with pink guttapercha base plate. The constant chewing on this pack spreads the teeth apart, stimulates and increases the growth of the alveolar process, giving sufficient room for the permanent teeth. While I am on this matter of the development of the jaws, I must not fail to say that the average child does not exercise his teeth sufficiently. In this day of pre-digested foods, the child is not compelled to masticate. To remedy this trouble I would advise the parents that instead of feeding their children upon this pre-digested food, they give it some dry toast, well buttered. The child being unable to swallow this hard bread, is compelled to masticate it, thus exercising the teeth and muscles of mastication, as well as causing a sufficient secretion of saliva for proper digestion of its food. The milk necessary for the child's welfare may be given separately. To my mind this would be vastly preferable to giving the child food sodden in milk or gravy, or even the time honored soft porridge, deluged in milk.

The manner adopted by some parents in feeding their children impels me to agree with Bobby Burns: "Human bodies are sic fools for a' their colleges and schools, that when nae real ills perplex them they make enow themselves to vex them." The importance of thorough mastication cannot be overestimated. It has been preached by scientific professionals, but it remained for a layman to give to us a forceful demonstration of this matter of so great importance. Horace Fletcher literally chewed his way from a weakling to an athlete. And so could the majority of children of this country chew their way from weaklings to athletes if the dentists would properly instruct the parents and the parents heed the instructions.

One of the most difficult things found in the treatment of children's teeth is the fact that in nine cases out of ten the child must have the toothache before the parent even thinks of taking it to a dentist. I have already given you the treatment of a typical case of this kind, but should you be so fortunate as to be put in charge of a child at an early period of the caries, I know of no better treatment while the caries is superficial in character than to take an orangewood stick in a port polisher on your engine and thoroughly polish the spot, then would I apply nitrate of silver with an orangewood stick, using the stick to rub the nitrate into the spot well. I do not approve of this method on permanent teeth. I have used it on a number and found that same black spot put there by the nitrate as much as seven or eight years afterward, but be it said in the favor of the treatment, that there was not the least sign of recurrent caries.

There is one practice which I notice seems to be very prevalent with dentists, that of filling these deciduous teeth with cement or some other temporary filling. I do not approve of this method of procedure. It is just as easy to fill the teeth with amalgam, which in most cases will save the tooth until it is lost by absorption of its roots. In filling these teeth with temporary fillings we create within the young patient the idea of the lack of permanency of dental work, which we sometimes find hard to overcome in after years, and with good reason, for if we believe the old adage, that, "as the twig is bent the tree is inclined," we must not be surprised that if in the children's youthful years we give them the opinion that dentistry is a temporary affair, we must expect in after years to find great difficulty in removing this prejudice.

One of the greatest menaces to the future perfect permanent teeth of children is the common practice of many dentists and physicians of extracting these teeth before the proper time. I have made it a rule of late years to instruct parents, and especially young parents, who have not had any experience with children's teeth, that it is of the utmost importance that the deciduous teeth should be removed by a dentist. I have often had parents come to me bringing a child with a loose tooth and insisting upon its extraction. Had I done so the result would have been the inevitable contracted arch. I know of no one thing that causes more trouble in occlusion than this premature extraction of the deciduous teeth.

That brings to my mind the first permanent molar. I think one of the most common experiences of dentists with children is to have a patient presented between nine and eleven years of age with this molar completely broken down. I know many of you will not agree with me, but I have long since adopted what I consider the best method in this case, that of extraction. The idea of destroying a pulp and filling root canals in the teeth of children of nine to ten years of age has long been by me considered a very questionable method—long before the recent agitation by the medical profession against the procedure of devitalization and imperfect root filling. If these teeth are extracted at the age of ten or ten and one-half years, the second permanent molar will move forward through the maxilla and take the place previously occupied by the first permanent molar, making a very good masticating apparatus.

Since the agitation by the medical profession against the procedure of devitalization and root filling, there has been revived the method of pulp capping, an operation very popular twenty-five years ago, but of late years it has fallen almost into complete disuse. I have done this class of work many years ago, but of late years have done none of it except in cases presented where the pulp was exposed prior to complete root formation. I cannot say how many fatalities have taken place in these teeth, but I can assure you that I have not had many return to complain. I expect to have some criticism passed on this method, and I invite that criticism, because I want to know what the experiences of other men are in this work. I will say however, that this method has appealed to me as being about the kindest thing that I could do for a little patient. I agree with Hegeman, who says: "I expect to pass through this life but once, if therefore there is any kindness I can show or any good I can do to any fellow being let me do it now, let me not defer nor neglect it for I shall not pass this way again."

If there is one thing that should be tabooed as much as possible in your work with children, it is the use of the rubber dam. If you want to disgust the child just put him under the rubber dam. He does not like the restraint in the first place, and in the second place he despises to have strings tied around the necks of his teeth. Most operations on children's teeth are or should be of short duration, and this being the case, they can very well be handled with cotton rolls. I have for a number of years used the Johnson cotton rolls, short length, one and one-half inches. I use preferably number three. If you have not used these rolls in your office, you will find them to be a very valuable assistance in your work.

The one thing that I would like to impress upon all of you is that you must not measure up a child with the same measure that you do an adult. The treatment necessarily cannot be the same.

One trouble that arises in the treatment of children's teeth, and it is a very vital matter too, is malocclusion. Now I hesitate to mention that word "malocclusion," because I know what a discussion it sometimes brings about among the profession. The different ideas of different men as to what constitutes proper occlusion, as well as what regulates that occlusion has been written upon until those opinions would make volumes. But whatever may be our opinion as to what constitutes a perfect occlusion, there is no dentist within the hearing of my voice, but that can discern an imperfect relationship of the teeth of one jaw to the teeth of the other. As to the cause of these things, I would not undertake to even venture an opinion, nor to open up this broad avenue of discussion. I know that different authors have different ideas of the causes. Some claim that it may be possible to trace the origin of malocclusion even as far back as the intra-uterine life, others claim that it is possible to prove that malocclusion is due entirely to the improper care of the child's mouth in early infancy, but on one point they all agree, and that is the necessity of stimulating the growth of the maxilla. This is too often overlooked, resulting in undeveloped jaws. From observation I would venture the assertion that you will not find a child with perfectly developed lungs where there is either a constricted palatal arch, or a prognathic lower maxilla, and if my observation is correct and based on a sound footing, then the importance of this matter becomes at once apparent. Initial caries in the first and second molars and bicuspids, which often appears almost as soon as these teeth begin to erupt, seems almost impossible to prevent without cutting out the grooves and therefore necessitating some filling, but this procedure has always been more or less unsatisfactory to me. I have adopted the method of taking these little patients and after washing out the sulci with peroxide of hydrogen, using a sharp pointed instrument for scraping any debris that may be stuck down in there, washing out again, then I have taken soft cement and worked it down into the sulci. I think this method of practice is excellent where we find the sulci to be very deep with indications of early decay.

There are many other matters and methods connected with the treatment of children's teeth that I should like to discuss in extended detail. The limit of time forbids me to do so, but I should feel that I had been guilty of negligence to my duty, should I quit this platform without earnestly enjoining you to take more interest in the subject of children's teeth. But whatever may be done by you in this important matter, whatever may be the result of your efforts; whether your work may be crude and primitive, or whether it may rise to the plane and dignity of scientific investigation; whatever you have accomplished, that much have you done toward shaping the destiny of mankind. History does not repeat itself. The pre-historic age with all of its crudeness and cruelty lies far behind us, never to return; the present with its manifold blessings and opportunities, is ours; the future with its radiant hope belongs to our posterity; but the record which we make today, be it an aggregation of errors or a combination of successful consummations, that record written upon the pages of eternity, becomes our history tomorrow.

CHRONIC FOCAL INFECTIONS ASSOCIATED WITH TEETH.*

BY WM. H. G. LOGAN, M. D., D. D. S., CHICAGO, ILLINOIS.

The purpose of this paper is to make a plea first for the dental profession to accept the responsibility of controlling chronic infections associated with teeth; secondly, to urge the universal acknowledgment of the precepts presented by Drs. William Hunter in 1900, F. J. Poynton in 1908, Kenneth Goadby in 1911, Frank Billings and Rosenow in 1912, Charles Mayo and Hartzell in 1914 upon the etiologic relation existing between chronic focal infections and such systemic diseases as chronic arthritis, neuritis, nephritis, the cardiovascular degenerations, neurasthenia, iritis and myalgia; thirdly, to outline a more thorough examination of the patient for diagnosis and determination of elimination of these chronic oral infections beyond that which is ascertained by radiographs and the customary inspection of the teeth and jaws and fourthly, to outline the course I believe the members of the medical profession should pursue when a patient presents who is suffering from a disease which may be due to infections associated with teeth. The full significance of the relation of chronic focal infections to serious disease has been made more plain by the recent investigations of Rosenow on "The Transmutation of

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*Read before the Illinois State Dental Society, May, 1916.

Bacteria," for he was able to transform, for example, the streptococcus into a pneumococcus or a pneumococcus into a streptococcus by a variation of the culture media upon which these bacteria were propagated; while in his communication on "The Elective Localization of Streptococci" he points out if the specific strains are taken from the person suffering from appendicitis, ulcers of the stomach and duodenum, cholecystitis, epidemic parotitis, myositis and endocarditis and introduced into animals, the animals become infected with appendicitis in 80 per cent of the cases, ulcers of the stomach 60 per cent, cholecystitis 80 per cent, rheumatic joints 66 per cent, myositis 75 per cent and mumps 73 per cent.

With the evidence before us that the streptococcus is the predominating factor in the production of the foregoing serious diseases and because of the established evidence presented in 1914 by Drs. Gilmer and Moody in their report entitled "A Study of the Bacteriology of Alveolar Abscess and Infected Root Canals" that the streptococcus is also the predominating bacteria in these infections and because of the sole dependence upon or improper interpretation of radiographs for diagnosis of infected dental areas chronic infections of the pulp are not being determined and normal dental structures are so frequently being sacrificed, it has become essential that additional evidence be secured to ascertain if a suspected tissue is the seat of a chronic infection before surgical interference is instituted or teeth extracted. The last statement was made because I know of many instances where operations have been suggested and performed about the mouth and jaws to remove supposed chronic infected tissues that did not exist.

Having declared my faith in the doctrine that chronic focal infections may be the cause of many serious chronic systemic diseases, let us now pass to a consideration of the diagnosis and determination of elimination of chronic focal infections occurring in the soft tissues, bone and alveolar process forming the jaws. In my opinion, next to the faucial tonsils, the infected bone cavities found about the root ends of pulpless teeth having no discharging sinuses are the most frequent cause of the spoken of chronic diseases. In 1913 I began the undertaking of ascertaining the usual blood findings in consecutive cases of chronic oral infection to determine if valuable information could be collected which would be of benefit in reaching a decision that chronic oral infection, though producing little or no discomfort, was in reality sufficiently active to produce characteristic blood changes which would be of diagnostic aid in deciding in favor of treating the infected foci with retention of the teeth or demanding extraction and possibly curettement of the area. Furthermore, I wished to determine if I could gain additional knowledge that would inform me when all infected areas were removed and the tract not re-infected during the healing process with the result of the wound healing apparently normally and leaving an infected tract similar to the one that acted as the initial etiological factor. Before discussing the case records, I desire to call attention to the fact that they were all of patients presenting at my office and should not be compared with those secured from individuals confined to the hospital from ill health. (These examinations were never made after the patient had partaken of a heavy meal and were all made by one person).

I herewith report on the blood findings of the first 218 out of my 287 consecutive cases of chronic oral infection associated with teeth, of which 110 are advanced pyorrhea cases where the clinical evidence of pus was present and in 96 per cent of the cases some teeth had been lost or were so seriously involved with the disease that extraction was demanded. The remaining 108 cases are of patients having chronic periapical infection without evacuating sinuses; however, 37 cases had pyorrhea co-existing.

DISCUSSION OF CASES SHOWING BLOOD FINDINGS AND CHANGES.

1. In the examinations as here made I found that neither pronounced nor moderate anemia were commonly associated with chronic oral infection in this series, as claimed by many authors, as pronounced anemia was found but once.

2. That leucopenia was more constant than leucocytosis in pyorrhea cases where the blood findings were abnormal, furthermore, leucopenia was more frequent in those cases where the pyorrhea pockets did not involve the root ends and in the absence of periapical focal infection without discharging sinuses, as shown in slide No. 1.

3. That leucocytosis when associated with pyorrhea was

most frequent where the pyorrhea pockets extended nearly to or did involve the root ends.

4. That abnormal blood findings were present in only 48 of the 110 pyorrhea cases examined, however, it should be kept in mind that these cases did not have confined infection at root ends.

5. That abnormal blood findings were present in 98 of the first 108 cases of periapical infections without discharging sinuses divided as follows: leucopenia 12 times. Leucocytosis 86 times. Let the foregoing statement be not misconstrued to mean that either leucocytosis or leucopenia is always present when a periapical infection without a discharging sinus is found for I had 10 cases of chronic infection at root ends where the blood findings were normal, for, naturally, periods arise when the effect of the pathogenic bacteria and toxins is so slight that no blood change is manifested. But, since severe secondary infections could occur during this period, a focal infection though producing no characteristic blood change must always be looked upon as a menace to the health of the patient and its eradication demanded.

Almost universally the patient was unaware of any discomfort about the tooth having chronic infection, the exception as a rule was where the involvement was advanced pyorrhea alveolaris. I recently had three patients present where the morning temperature was subnormal varying from one to one and one-half degrees and an afternoon abnormal temperature of from one-half to two degrees, which ceased as did the secondary involvement with the removal of the chronic infection about root ends. In a number of instances patients had the following symptoms besides the secondary disturbances; severe mental depression, a dryness of the mucous membrane of the oral cavity and an apparent reduction in the amount of oral secretions, brief periods of dyspnea associated with sharp pains in the thyroids, severe one-sided headaches, pain described as starting at the base of the brain spreading backward, upward and forward, gastric disturbances taking the form of nausea following severe short periods of nervous depression. In some instances the patient would affirm he felt normal throughout the day with the exception of acute fatigue lasting from one-half to one and one-half hours with the onset sudden and the passing gradual.

I desire to call attention to a few cases for the purpose of showing the changes occurring in the blood pictures with the eradication of the focal infection when a patient presents with an abnormal blood finding.

In case No. 79 the hemanalysis showed:

Hemoglobin	93%	Polymorphonuclears	70%
Erythrocytes per cu. mm.	4,840,000	Large Mononuclears	5%
Leucocytes per cu. mm.	9,600	Small Mononuclears	25%
		Eosinophiles	0

A few days after the dentist had been able to carry the remedy to or through the root end, the blood count changed to:

Hemoglobin	100%	Polymorphonuclears	60%
Erythrocytes per cu. mm.	5,016,000	Large Mononuclears	8%
Leucocytes per cu. mm.	8,000	Small Mononuclears	30%
		Eosinophiles	2%

The secondary involvement began to improve and continued to do so until a brief period after the root canals were filled; then upon complaint from the patient that the original secondary trouble had returned, another blood count was taken which showed:

Hemoglobin	100%	Large Mononuclears	2%
Erythrocytes	4,976,000	Small Mononuclears	24%
Leucocytes	10,400	Eosinophiles	2%
Polymorphonuclears	72%		

A radiogram then taken proved the root canals had not been more than two-thirds filled. The root canal filling was removed and treatment again undertaken. The dentist in charge decided he would be unable to perfectly fill the canals and the patient was allowed to go with the remedy in the tooth for six weeks. The neuritis increased and the blood examination made six weeks after the last treatment had been placed showed it to be practically the same as the original count. I removed the tooth and curetted the periapical area. The blood count taken a few days after was normal. The neuritis ceased.

Hemoglobin	102%	Large Mononuclears	5%
Erythrocytes	5,008,000	Small Mononuclears	32%
Leucocytes	8,400	Eosinophiles	0
Polymorphonuclears	63%		

Case 70 was a patient thought to be suffering from a chronic infection in the form of pyorrhea only and the blood examination showed slight leucocytosis which did not materially change after treatment, nor did the first series of radiographs of the teeth show a rarefied area, but upon Faradic test a pulpless bicuspid was found. This tooth was treated—root canal filled—the secondary involvement disappeared—the blood count returned to normal and has remained so.

THE COURSE I BELIEVE THE MEDICAL PROFESSION SHOULD PURSUE WHEN A PATIENT PRESENTS WHO IS SUFFERING FROM A DISEASE WHICH MAY BE DUE TO INFECTIONS ASSOCIATED WITH TEETH.

This question is of urgent importance because many medical practitioners in searching for focal infections have found such a large percentage occurring about root ends of teeth where root canals have been filled they have reached the conclusion it is unsafe to retain a pulpless tooth and have informed patients an infection always occurs about it and requested extraction. In other instances they have demanded of dentists not to remove pulps and fill root canals for any of their patients. With some it has become common practice to decide what is best for the patient's teeth from radiographs with the result there has unfortunately developed during the last few years, a feeling of discord between the members of the medical and dental professions over this problem of who should decide what to do with teeth involved with chronic infection. Until the last five years it is true the dental profession has not been sufficiently careful in filling root canals definitely and aseptically and much of the criticism was justified; but at the present time an increasing number of dentists are employing every known aseptic measure and are checking up root canal operations with radiographs. Therefore, with the evidence presented of the regeneration of bone in infected rarefied areas following treatment through the tooth and good root canal fillings, is it not unwise for any group of men, either dental or medical to decide that a chronic infection always occurs about the root ends of pulpless teeth and their retention is not indicated, until more definite proof is at hand?

The foregoing case histories and last statement give me the opportunity to suggest to those called upon to determine the presence of chronic focal infections associated with teeth, not to confine their examinations only to the supporting structures and radiographs taken of the roots to outline rarefied areas, for one may have a pulpless tooth present without a rarefied periapical area and at the same time have a chronic infective process in the remnants of pulp tissue, which I have found to be accountable for serious secondary effects.

Nor can one with any degree of assurance eradicate all periapical infections by the mere extraction of teeth unless it be followed by a curettement, and in a few instances I have had patients go several months without symptoms of the original secondary involvement and then have noted their appearance without the development of a new focal infection; and upon making blood examinations I found the possible evidence of a chronic infection, although the tissue had healed with every appearance of being normal over the area where the tooth was removed. I then opened into the old infected tract, found the evidence of infection which in some cases has been streptococcus in pure cultures. Therefore, it becomes necessary to do something mor than extract teeth or amputate roots and do an indifferent curettement, to secure positive elimination of focal infections associated with teeth.

The appropriate procedure when a patient is suffering from a disease possibly caused by a chronic oral infection is to have radiographs taken of all pulpless teeth, their supporting structures and of the jaws for partially or totally impacted teeth. If questionable areas are found, blood examinations should be made—then if the physician with the patient will consult the family dentist or oral surgeon to determine if the infection can be controlled with retention of the teeth or if extraction with or without curettement is indicated and also ascertain the important information whether or not any tooth contains an infection confined to the pulps which the radiograph would not reveal in any case, then and then only, will the patient's welfare in so far as the mouth and teeth are concerned be properly protected. I speak of this conference because I am aware that in many communities there are medical men who maintain every tooth should be extracted about which a chronic infection is found and on the other hand we meet dentists who wish to retain most of these dental organs. In closing this part of the discussion I wish to give a word of warning against the removal of many teeth for these patients at one time, for serious effects have frequently resulted when too many infected areas have received simultaneous surgical treatment. Even in the removal of a single infected area, we expect an exaggeration of the symptoms resulting from the secondary lesion.

The sane position to take, as I see it, is that it is unwise and possibly unfraternal for the medical profession to decide when such teeth should be extracted. For as a body they have not been trained sufficiently in dental pathology to know when a chronic peridental infection is extensive enough to demand extraction. Therefore, the dental profession can rightfully ask the courtesy of the medical profession that such patients be referred to the family dentist who will diagnose alone or in consultation with those particularly fitted in this work, whether the teeth can be retained and the chronic infection permanently controlled. Yet, some medical specialists have informed me they are not justified in sending the patient to the family dentist because he will not assist in demanding the extraction of all hopelessly diseased teeth and this, to a degree, is true for we find many members of the dental profession who day after day are retaining teeth for bridge abutments about which exist incurable chronic infections. All such teeth should be extracted and the diseased areas around them properly treated. Hopelessly diseased pyorrhea teeth are sometimes retained because they can be made comfortable, root ends are being amputated without regard to the surrounding bone involvement—to the end that in both instances the infection is only temporarily controlled and the injurious effect to the patient allowed to continue.

As I see it the dental profession must adopt this axiom: All teeth involved with pyorrhea alveolaris or having chronic infection about root ends which cannot be controlled must be extracted—or stand convicted before the medical profession and the public as being unable or unwilling to properly care for the health of patients in accordance with the findings of our most scientific investigators.

CONCLUSIONS.

The contention has not been made that one can universally determine the presence or absence of a low grade infection associated with teeth by blood examinations and it would be unscientific to place too great a value on blood percentages in their bearing on the question of positive diagnosis of the presence or absence of a low grade infection for this would be to imply a neglect of certain fundamental principles in biology; yet the hope is expressed that the hematologist will soon present us with a technic that is as positive as those employed to ascertain typhoid fever, diphtheria and syphilis.

Chronic infections may be associated with teeth and the blood findings be normal but such findings were not the rule in this series of cases.

Leucopenia was the common blood finding associated with pyorrhea where the pockets did not extensively involve the apical third of the root.

Pronounced anemia was not commonly associated in this series.

Leucopenia was more constant in pyorrhea cases while leucocytosis was far more constant in infections confined at root ends without discharging sinuses.

Secondary involvements were found to be due not only to chronic infections associated with the supporting structures of teeth but to infections involving the dental pulp only.

The blood findings were only found of value as diagnostic aid when abnormal in the manner described in the text.

I have received sufficient assistance in the management of chronic oral infection associated with obscure secondary involvements to adopt hemanalysis as routine practice where the apical third of the root is involved by extention of the pyorrhea pocket or periapical infection with or without a discharging sinus is present.

I have found that the described abnormal blood findings can be temporarily controlled by the placing of remedies in the root canals. (See case 79)

It would appear that the normal range of variation in the leucocyte count and polymorphonuclear percentage is more limited than generally stated by our authoritative works, therefore I have accepted as normal the following table which is employed by certain well known laboratories:

Hemoglobin	85% to 100%
Erythrocytes per cu. mm.	4,250,000 to 5,000,000
Leucocytes per cu. mm.	7,000 to 8,500
Differential Count (Eosin and Haemotoxylon stain.)	
Neutrophiles.	
Polymorphonuclears	60% to 65%

with the proper balance of large and small mononuclear Lymphocytes and Eosinophiles.

Although outlines have been suggested I desire to emphasize the importance of considering every case as an individual one which demands thorough investigation before a decision can be reached as to the proper course to pursue, for the man who undertakes to cure human ills by rule of thumb will frequently go far astray.

The prophesy is here made that chronic infections associated with teeth will not be effectively managed until the dentist's education includes more of bacteriology and general pathology and the physician's knowledge of dental pathology is more comprehensive.

The usual blood findings in pyorrhea cases where the disease does not involve the apical third of the root:

	Case 135.—Age 57. Sept. 19, 1914	Case 65.—Age 62. Oct. 27, 1914.
Hemoglobin	88%	88%
Erythrocytes	4,024,000	4,640,000
Leucocytes	5,600	6,600
Polymorphonuclears	54%	58%
Large Mononuclears	4%	9%
Small Mononuclears	39%	31%
Eosinophiles	3%	2%
Blood Pressure Diastolic	90	92
Blood Pressure Systolic	130	120
Pulse Pressure	40	28

Case 217—Age 38. Patient suffering from neurasthenia for three years, complained of periodical pain in the thyroids and nausea following the mere severe periods of nervousness. Pains in the neck radiating up over the head with a fullness in the ears. Repeated examination of the entire body, with the exception of the mouth, found nothing abnormal that could be held as a caus-

ative factor. The hemanalysis showed the possible evidence of chronic infection. The radiographs revealed rarefied areas about the root ends of three teeth and two impacted third molars.

Hemanalysis before and after the infected areas had been eliminated:

	Nov. 18, 1915.	Dec. 23, 1915.
Hemoglobin	96%	97%
Erythrocytes	4,952,000	4,704,000
Leucocytes	12,000	8,200
Polymorphonuclears	76%	62%
Large Mononuclears	8%	3%
Small Mononuclears	16%	35%
Eosinophiles	0	0

The more extensively involved teeth were extracted, the areas curetted and the other teeth retained and treated. The blood findings changed to normal. The secondary involvement was exaggerated for a few days after the operation followed by a total disappearance of the above stated symptoms and a gradual improvement in health.

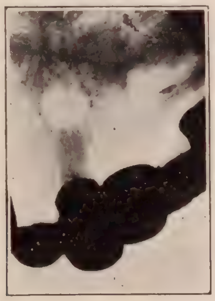
Case 253—Age 24. Patient suffering from severe sciatica for three months, confined to the hospital for three weeks. Molar tooth extracted because of the presence of a chronic infection about the root end two months previous to my examination and patient improved for ten days. Then the sciatica returned in its full intensity and he was unable to walk for a few days at a time. Careful examination of the socket from which the tooth was removed revealed the presence of a chronic infection. After noon abnormal temperature of one-half to two degrees.

Hemanalysis before and after the infected area had been eliminated:

	Feb. 18, 1916.	Mar. 17, 1916.
Hemoglobin	93%	95%
Erythrocytes	4,520,000	4,888,000
Leucocytes	9,200	7,000
Polymorphonuclears	72%	58%
Large Mononuclears	11%	11%
Small Mononuclears	17%	30%
Eosinophiles	0	1

Socket curetted February 18, 1916. Sciatica was exaggerated and patient was confined to his bed for a few days, but gradually improved and returned to work.

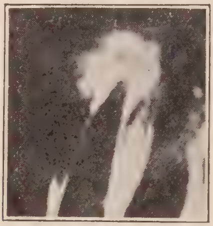
Case 106—Age 46. Patient complained for years of severe pains starting at the back of the neck and base of brain radiating up the back of the head and forward to the temples with fleeting pains in the anterior part of the upper jaw. Hemanalysis revealed the possible evidence of infection. Hemanalysis before and after the infected area had been eliminated:



	Feb. 12, 1915.	Apr. 21, 1915.
Hemoglobin	91%	96%
Erythrocytes	4,456,000	4,784,000
Leucocytes	11,200	7,000
Polymorphonuclears	74%	61%
Large Mononuclears	2%	5%
Small Mononuclears	24%	32%
Eosinophiles	0	2%

Radiograph showed the presence of an impacted tooth with a rarefied area present. Tooth was removed and the area curetted. In ten days the severe headaches ceased and to date there has been no return.

Case 225—Age 37. Patient suffering from articular rheumatism for seven years. Tonsils removed two years ago. Hemanalysis revealed the possible evidence of chronic infection. Radiographs showed rarefied areas about the root ends of two teeth.



Hemanalysis before and after the infected areas had been eliminated:

	Dec. 4, 1915.	Jan. 12, 1916.
Hemoglobin	94%	99%
Erythrocytes	4,448,000	4,752,000
Leucocytes	14,000	7,800
Polymorphonuclears	75%	60%
Large Mononuclears	3%	7%
Small Mononuclears	20%	32%
Eosinophiles	2%	1%

Teeth were extracted and areas curetted. Hemanalysis taken five weeks later was normal. The articular disturbance was not exaggerated for the next few days after the operation as is frequently the case. Patient has gradually improved and is able to get about comfortably.

Case 64—Age 48. Patient suffering from serious iritis. All causative factors with the exception of pyorrhea about the four inferior incisors had been excluded. Chronic infection about these teeth thought to be the definite cause of the iritis. Teeth extracted one week ago, patient feels there has been some improvement since the extraction of the teeth. Mouth had been examined and declared to be free from all chronic infection. Radiographs showed two bone abscesses. Hemanalysis showed possible effects of chronic infection upon the system.

Hemanalysis before and after the infected areas had been eliminated:

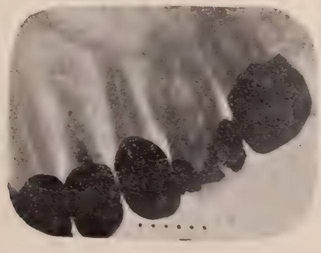
	Oct. 23, 1914.	Nov. 4, 1914.
Hemoglobin	70%	93%
Erythrocytes	4,440,000	4,732,000
Leucocytes	10,400	7,600
Polymorphonuclears	72%	64%
Large Mononuclears	1%	6%
Small Mononuclears	25%	29%
Eosinophiles	2%	1%

Teeth extracted and bone areas curetted October 24, 1914.

Vision reported normal by those in charge November 3, 1914.

Case 283—Age 55. Patient suffering from endocarditis which was held by the diagnostician in charge to be due to a focal infection. Hemanalysis showed the possible evidence of chronic infection. Radiographs revealed rarefied areas about two teeth.

Hemanalysis before and after the infected areas had been eliminated.



	Apr. 22, 1916.	May 2, 1916.
Hemoglobin	98%	100%
Erythrocytes	4,720,000	4,800,000
Leucocytes	9,400	8,600
Polymorphonuclears	70%	63%
Large Mononuclears	3%	7%
Small Mononuclears	25%	29%
Eosinophiles	2%	1%

Teeth were extracted and rarefied areas curetted. The internist and patient state that noticeable relief has resulted from this procedure.

Case 212—Age 53. Patient suffering from neuritis and articular rheumatism of long standing.

Hemanalysis before and after removal of extensively involved pyorrhea teeth:

	Nov. 5, 1915.	Jan. 14, 1916.
Hemoglobin	95%	99%
Erythrocytes	4,848,000	4,960,000
Leucocytes	11,800	7,800
Polymorphonuclears	70%	59%
Large Mononuclears	10%	10%
Small Mononuclears	20%	31%
Eosinophiles	0	0

All extensively involved pyorrhea teeth extracted followed by a gradual improvement and at the present time patient is free from all discomfort.

Case 247—Age 38. Patient suffering from sciatic neuritis of four years standing. Hemanalysis showed the possible evidence of infection. Radiographs revealed rarefied areas and an impacted tooth.

Hemanalysis before and after the infected areas had been eliminated:

	Feb. 5, 1916.	Feb. 11, 1916.
Hemoglobin	100%	101%
Erythrocytes	4,920,000	4,960,000
Leucocytes	9,000	8,600
Polymorphonuclears	69%	65%
Large Mononuclears	4%	7%
Small Mononuclears	27%	28%
Eosinophiles	0	0

All teeth having rarefied areas about them were removed and areas curetted, impacted tooth was removed. The secondary involvement was exaggerated for a few days followed by gradual and constant improvement and patient is carrying on his medical practice with comfort at the present time.

Case 223—Age 23. Patient suffering from neuritis of the left shoulder and arm which prevented her carrying on her work as stenographer for four months. Body held to be free from infection and the tooth about which a rarefied area was present had been extracted. Blood examination showed the possible evidence of chronic infection. Radiograph revealed the old rarefied area still present.

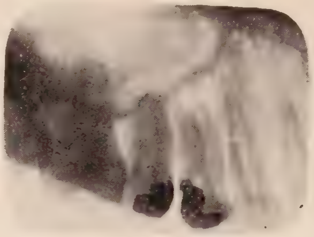
Hemanalysis before and after the infected area had been eliminated:

	Nov. 30, 1915.	Dec. 20, 1915.
Hemoglobin	89%	91%
Erythrocytes	3,784,000	4,080,000
Leucocytes	10,200	7,200
Polymorphonuclears	74%	58%
Large Mononuclears	5%	8%
Small Mononuclears	18%	34%
Eosinophiles	3%	0

Infected area opened and curetted. Neuritis increased for two weeks with a gradual reduction during the next three weeks, then the patient returned to original duties as stenographer and has been free from discomfort to date.

Case 138—Age 43. Patient suffering from mild facial paralysis which those in charge believed to be due to chronic focal infection. Hemanalysis showed the possible evidence of infection. Radiographs revealed rarefied area about the first bicuspid.

Hemanalysis before and after the infected area had been eliminated:



	Apr. 9, 1915.	May 6, 1915.
Hemoglobin	94%	95%
Erythrocytes	4,640,000	4,808,000
Leucocytes	11,200	7,600
Polymorphonuclears	71%	60%
Large Mononuclears	5%	4%
Small Mononuclears	24%	35%
Eosinophiles	0	1%

Blood Pressure Systolic 154
Blood Pressure Diastolic 110
Pulse Pressure 44

Tooth was removed and infected area curetted. Patient regained full use of facial muscles in about six months' time without other treatment. In removing this focal infection the greatest benefit was probably the elimination of its influence upon future recurrence of the paralysis.

THE TURKISH BATH; WHAT IT IS; WHAT IT DOES; HOW IT DOES IT.

BY DR. L. P. HASKELL, CHICAGO, ILL.

It is not as many suppose, a steam bath, but a hot air bath. It is not a weakening process as some physicians imagine, but a tonic, and therein differs from a steam or hot water bath, which are enervating, and unlike these baths, can be taken after eating, as it aids digestion instead of retarding.

The modus operandi of the bath is as follows: Divested of clothing, the bather lies upon a lounge or reclining chair, with sheet wrapped around, in a temperature varying from 150° to 175° and what results? Nature demands relief, and the skin responds by opening the pores, nature's sewerage channels, and soon perspiration becomes profuse. Three things result, absolutely essential to health, viz: the elimination of the poisonous secretions; to do this the blood must come to the surface; then what follows? The circulation is established over the entire surface, and as a consequence, all congested conditions are relieved and so the final result is the entire system is in a condition to relieve itself from disease. As art has done all it can, nature does the rest.

Now the patient lies upon a slab, and the assistant gives a thorough massage, then washes off the accumulated material from the pores, passes to the shower, or spray, warms and gradually cooler, then wiped, and go to the cooling room to lie upon a lounge (not wrapped in a blanket as is the custom of some). Here you are perfectly comfortable, and as soon as dry and cool, you dress.

Although having perspired profusely you are better fortified against taking cold because the pores are no longer perspiring, and circulation is restored to the surface.

A brother-in-law, a physician, having conducted a Turkish bath sanitarium for twenty-five years in Milwaukee, I became familiar, theoretically, practically and personally with its results.

As evidence that the bath is not weakening, but a tonic, Dr. Hanson's rule was the weaker patients were treated to two baths a day, instead of one, and his experience demonstrated that they recuperated more rapidly.

This paper is written to show the dentist that after a hard day's work at the chair a thorough Turkish bath will make him feel like a new man.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held April 4, 1916, at 8:00 p. m., Dr. P. J. Kester, in the chair.

Dr. H. H. Schuhmann read a paper on "Infection of Vincent's Angina."

DISCUSSION.

Dr. Edwin G. Kirk, Chicago:

This subject presents two problematical aspects,—first as to the proper identification of the Vincent organisms, and secondly as to their possible pathogenicity. There is little difficulty as to the first. The only oral forms with which they are at all liable to be confused can usually be differentiated by means of the simple direct smear, for their morphology is rather characteristic. Dr. Babes (in the Kolle Wassermann Handbuch) has discussed the variants of the fusiform bacillus. The spirillum differs considerably from the ordinary mouth spirochetes. The criteria of differentiation between spirochetes and spirilla are not yet definitely settled from a classificatory standpoint. But for practical purposes the Vincent's organisms are usually easy of identification. Cultural methods are difficult, and require considerable experience for successful application. The work of Weaver, Tunnicliff and others has made it probable that Vincent's spirillum and bacillus represent two phases of the same organism. Or at least they are so closely symbiotic that they are the equivalent of a single organism.

But the most important problem is, is this organism of pathogenic significance for the disease processes in which it is found? Or is it a secondary invader? In many and varied necrotic processes in the mouth and throat it is found in great numbers, and often almost to the exclusion of other bacterial forms. Thus in the true clinical form of Vincent's angina, in ulcerating and aphthous stomatitis, sometimes in soma, in scurvy. In some conditions, as for example, mercurial stomatitis, it is abviously merely a secondary invader. Yet in many of the diseases mentioned it is found deeply invading the tissues, and, indeed, almost the only organism. None of these observations afford absolute proof of its pathogenicity. Personally, I believe it is a pathogen.

What are the future modes of attack of this problem? First by comparison of the bacteriologic findings in large series (many thousand) of normal and pathologic mouths, including all sorts of lesions, pyorrhea, sinuses, etc. This part *must* be done by the practitioner, for only he has the opportunity. The direct smear examination with, say, a Gram of methylene blue stain should always be made.

Secondly, it is probable that animal experimentation in selected cases will help out. Dr. Babes has begun the work along this line. The three laws of Koch should be satisfied if possible.

Dr. C. N. Johnson:

This subject is of daily and growing importance to us. We should early endeavor to ferret out the nature of the disease.

Dr. Schuhmann has used the term "Vincent's spirillum," but Dr. Hinman uses the term "Vincent's spirochete." There should be a more definite distinction. Dr. Hinman recently said that in his observation he had never found a case of acute ulcerous gingivitis, as described by Dr. Gilmer, where in making a smear he had not been able to find Vincent's microörganism.

In this disease the process occurs in the inter-proximal spaces, with a melting down of the gums, accompanied with extremely offensive breath. This acute ulcerous gingivitis is on the increase. It is especialy important to follow out the pathology of this disease very early.

Dr. J. E. Hinkins:

The records of Dr. Matthews and myself for five years do not show Vincent's organism, unless associated with stomatitis, gingivitis and other well known forms of oral infection. The fusiform bacillus and the spirillum are found together.

Dr. Truman W. Brophy:

Extraordinary patience and perseverance must have been required to develop the findings brought out by Dr. Schuhmann's paper; and yet there is a fascination and a satisfaction accompanying such work. Such a bestowal of time and energy and patience should be better and more generally appreciated. Such study brings as its principal reward the satisfaction of accomplishment. It is prompted by a love of science and of the development of scientific truths.

My experience with this condition has been chiefly clinical.

I have often felt uncertain as to the real pathology of it. This doubt can be removed only by careful bacteriological examination. Dr. Kirk has been animated by the same love of scientific investigation as has Dr. Schuhmann.

The differentiation of the causative organism is very difficult. I recall the case of a woman having a large mandibular tumor, which had been repeatedly operated on, and which appeared much honeycombed on examination. It seemed to be either tubercular or syphilitic. It turned out to be the latter. Of course, anti-luetic treatment was the only thing to be done in this case. The operations had been entirely erroneous.

I recall also the case of a child five months old with an enormous lingual hypertrophy. At first this seemed to be an enormous ranula. The exploring needle showed fluid. The tongue had the appearance of liver. It turned out to be a lymphangioma. The only treatment, of course, was the ligation of the vessels.

These instances illustrate the importance of examining the histology and the bacteriology of the conditions presented.

Dr. Sydney J. Knowles:

This paper brings to us a realization of the very large field ahead of us in this direction. This subject is very complex. This is shown by the fact that no very definite conclusions have been reached after continuous study since the year 1882. The determination of preventive measures is of equal importance with the identification of the causative organism.

The condition of impacted molars evidently plays an important part in this condition. Doubtless, cases once thought to be simple gingivitis were really Vincent's angina. We should first make a bacteriological examination from a microscopic smear, and then proceed to treatment.

Dr. L. L. Davis:

We recognize that there is a lesion where these bacteria congregate. Do not go into pus pockets, especially about second or third molars in the lower jaw, where there is any swelling or a tendency to laryngitis, until you have discovered the cause of the trouble, because otherwise an intense and deep and perhaps fatal infection is liable to be produced. This is a condition calling for the attention of the medical man at the outset. Deplorable and fatal results may follow a failure to observe this warning.

Dr. J. H. Woolley:

Obviously in the presentation of such a paper as that of the essayist, there is a great deal more back of it, within the knowledge of the essayist, which time does not permit of his giving to us. Many of us have not the patience and love for special investigation and research work that we should perhaps have.

There is going to be a great further broadening and widening of the sphere of the dentist in the near time to come, just as there has been such a great evolution in dentistry in our own lifetime, and as there has been in the development of bacteriological investigation.

Dr. Kirk:

This problem in its last analysis is to be solved by the oral surgeons. The pathologist and the bacteriologist have had a good opportunity during the last twenty-five years to solve this problem, but they have not done so. It will be necessary for the oral surgeons to apply in their offices and laboratories the methods of the bacteriologist. The matter will have to be taken up in the dual aspect of the clinical and the bacteriologic.

Dr. Schuhmann (closing the discussion):

Gentlemen: —

Before taking up these concluding remarks, I wish to thank you for the very kind reception you have given my efforts. I wish to thank Dr. Brophy particularly for the kind manner in which he spoke of me, but I feel that a good deal of the praise is unwarranted inasmuch as my working and studying along the lines he suggested, is being done from a purely selfish desire. I do it because I enjoy it. I realize that the mainstay of all medicine and surgery is diagnosis and it is for that reason that I find the study of all underlying principles, so interesting. In closing the discussion you will have to pardon me if my remarks seem to be somewhat unhinged, as I shall endeavor to answer the various remarks in the order in which they were made. The offensive breath mentioned in cases of ulcerous stomatitis may have been due to various causes, namely to necrotic tissue, to gas produced by various saprophytes and principally due to the activities of the spirocheta mucosum which as I mentioned was found by Noguche to be the specific organism, which in cases of pyorrhea and other ulcerated conditions, was always found to be present, and invariably was the causative organism for the offensive odor. As to the frequency of Vincent's Angina I do not wish it to be understood that I brought this discussion before you because of the fact that I considered it a common infection but simply to draw your attention to the possibilities of more or less infrequent infections in the oral cavity and in order to impress you with the need of patience and ability to recognize them when you see them. Having had four such cases, within a year, in my limited practice, I feel it well worth while to draw your attention to it. As to the symptomatology of this disease, it is quite true that when it is located in the region of its natural habitat, namely in the pharynx, the characteristic appearance of the sores would lead a diagnostician to promptly suspect the disease in question, however, when these organisms are transplanted to other localities in the buccal cavity, the appearance of the lesions is not as characteristic. In the afore-described cases of which I spoke, only *one* showed the typical scab covered ulcer. As to the remarks on "ulcerous gingivitis," I want to say first, that it is unfortunate, that writers are so apt to coin names for things which appear new to them. Of the various forms of stomatitis, which occur in inflammatory processes of the oral cavity, there are no less than seven which have been well known for some time. It is unnecessary to name any here, but one ulcerous pseudomembranous stomatitis. This variety of stomatitis is usually caused by a Vincent infection, and the organisms can be very readily detected in the pseudomembrane, and the "ulcerous gingivitis" mentioned was undoubtedly, a case of this kind. With reference to smears from healthy mouths, the main result from my investigations has been that I have come to the conclusion that these smears vary most markedly from those obtained from virulent cases of infection, in "the very wide difference in numbers of the bacillus fusiformis." The danger mentioned from entering into deep pus pockets far back in the mouth was a point well taken. I consider it a serious matter to stir up possible infectious material far back in the mouth, near lymphatic glands, and would advise before entering such pockets, with instruments, to wash them out with mild antiseptic solutions by means of syringing in order to remove at least part of large quantities of infectious material and then only to proceed cautiously with instruments.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-SECOND ANNUAL MEETING, HELD AT SPRINGFIELD MAY 9-12, 1916.

DISCUSSION OF DR. L. B. TORRENCE'S PAPER ON "THE TREATMENT OF CHILDREN'S TEETH."

Dr. Grafton Munroe, Springfield:

Mr. President, Ladies and Gentlemen.

I am pleased to have the privilege of entering the discussion of this paper, bearing upon our relations and duties to children and the treatment of their teeth for I regard it, as the essayist has declared, as one of great importance.

Having read before this society two other papers under like headings—one, "Guardianship of the Teeth" in 1893, and another, "Our Younger Patients" in 1906, I recall one prediction along the line of prophylaxis; a subject which the essayist has announced in the second line of his paper—in which I said, that before many years the tooth brush drill would be a part of the school programme. Today with the establishment of school nurse service and school dental infirmaries many of our communities are helping spread the propaganda of prophylaxis that only the persistent ignorance of parents can check, for the opposition to the examination by the nurse is growing very rare.

It is my sincere desire to see established in my own community and I hope it may be considered worth while for other even smaller cities, to obtain the co-operation of the two boards, of education and health, whereby a joint appropriation would maintain an infirmary with a salaried dentist, where the worthy poor of our schools might obtain proper attention at the ages which constitute childhood. I believe this is not too Utopian—perhaps it has been inaugurated along similar lines elsewhere. I know it has been accomplished by large bequests—such as produced the Forsyth Institute and others.

The wave of prophylaxis has taken hold of some of the Eastern cities and young women are enlisting in the service of simple prophylactic treatment for school children. It would be well worth your time if you have not already given it time, to read the article in October, 1915 *Cosmos,* from the pen of Mrs. Hubert W. Hart of Hartford, Conn., stating, that classes of young women were formed from the graduates in their city high school, who took up a special course of study in oral hygiene and their work developed under competent supervisors until the city authorities were induced to give double the first sum, which reached into the thousands.

These oral hygienists became so proficient that the children's mouths were no longer hot beds of infectious germs and the progress made and the lessening of the deficient classes became very marked. The hygienists were fitted out with portable outfits and went to the children, becoming a part of each school, instead of having one place where the little youngsters must go, often by force. By such methods and others too numerous to mention here, the gospel of clean mouths has spread in the community mentioned so that there is no lack of patients, for the children go and have the mouth cleaned up and come away bragging on the pleasures experienced. These methods are called to your attention because we think that all Dentists should boost for prophylaxis and do something towards the adoption of helpful ideals in all communities.

The essayist has spoken of the health of the child as related to the plan of feeding. Too much cannot be said of the importance of the naturally fed child as compared with the bottle baby; nutrition is a serious question in the early life of every child and a whole train of unfortunate circumstances and results are attendant upon malnutrition.

The management of children is nearly a specialty. Many times I have thought it might be relegated to a lady Dentist but I am not willing to believe that man cannot "suit his temper" to the often trying ordeal we meet with in the care of children. After a practitioner gets to the place where time is an element that demands consideration, then the pocket-book of the parent rebels if the dentist demands a fee for time consumed. If the parents were required to pay for the thoughtless words they use in talking about their own visits to the dentist, especially in the presence of the children, then the little folks would not consume so much time and hence much of the work for them would not be looked upon as so expensive. The difference in temperaments makes this problem of work on children one of mutual adaptability.

The essayist describes a very nice treatment for abscesses of temporary molars. Most of these cases are not ones that can be extended for treatment over several sittings, for generally by that time they burst buccally and the pain is then over, besides that, a busy dentist could hardly take care of such cases when his appointments are booked ahead for many days. It has been my method to relieve the putrescent condition which produced the abscess—by usual methods—then place a mild antiseptic paste or cotton in the canal—fill the carious cavity and make a free buccal vent, this restores the interproximal space where these cavities usually come and renders the teeth usable for quite a good time. For the protection of the interproximal gum when placing any plastic filling—temporary or permanent—I have found a piece of twisted Jap paper, a most valuable adjunct, easily removed by means of the end projecting cervically.

Some one has said: "Poets are born, not made"—so some dentists are found with tact and almost genius, that inspires the child and draws him into a confidence that is the keystone of future success. Truthfulness is absolutely essential and deception must be a minus quantity, but with these qualities there should be a happy mingling of firmness, dexterity in obtaining a definite result, and gentleness. The essayist has mentioned the retention and filling of broken down roots. I question the propriety of filling temporary roots; they are more likely to continue healthy left unfilled and kept reasonably clean than filled and followed by abscess conditions, for submarine operations, as these must be, are apt to be followed by irritating conditions. If however the patients are not willing to pay for a space retaining appliance, the roots should be kept until erupting tooth pushes them out.

The essayist has made his subject-title large enough to allow a touching upon the disturbances incident to dentition. This important period may be attended by systemic conditions due to the pressure of the erupting teeth and faulty nutrition, with other complications, which may endanger the life of the child. Pathological conditions at apex of roots will check absorption; such is also to be observed in rachitic or anemic children. When there is faulty absorption the permanent teeth are deflected in their eruption. In the anterior part of the mouth a good way, but not a nice appearing result in the treatment of interproximal decay is to cut away the incisal angle and after removal of carious debris—cauterize with nitrate silver, thus arresting decay and the space made permits of complete cleansing.

It is certainly commendable that our essayist has dwelt upon the importance of keeping the deciduous teeth as long as possible, thereby maintaining the wedging process caused by the onward push of the permanent teeth which promotes the expansion and development of the jaw, for when the spaces appear between the baby teeth at the ages, from three to five or six years, we can be sure development is proceeding all O. K. There is one place however when space between newly erupted permanent teeth must receive attention. I refer to the fraenum labii—if an abnormal fraenum is allowed to exist it will hold or maintain an abnormal space between centrals and sometimes result in these teeth occupying too much space and thereby deflecting the laterals into a rotated position or out of line entirely.

In regard to the first permanent molar so much can be said and written that I will not attempt to cover it fully. I would say that this tooth is first in importance for the diagnosis of malocclusion. It is so important in many other ways and it is so little looked after by such a large number of people that its loss becomes a serious calamity manifest orally and facially, for it leads to a shifting of the other teeth into malocclusion. I question the benefits that can come from the extraction of this molar. If this is resorted to, there must be a balancing by extraction on the right and left sides—otherwise there will be a shifting of the median line.

The essayist speaks of malocclusion as a somewhat dangerous point to touch on but if it is recognized early in the treatment of children's teeth and the practitioner has the real interest of the child at heart he will call the attention of the parent to the abnormal condition, and taken in hand, the little one may be saved a more elaborate and protracted time of treatment by the specialist. Malocclusion is often caused by early improper breathing, starting in colds, leading to inflammation and catarrhal conditions producing adenoids and enlarged tonsils. Of course these force the child to breathe through the mouth and the action of the facial muscles contracts the arches and results in the malocclusion so early detected in the pinched faces plainly observed without even a mouth examination.

These attentions are often appreciated by children and when they realize that they can be brought into normal conditions, if the parents do not become too solicitous and alarm the children they will be eager to have their teeth and faces look just as well as others more fortunate than they. We may conclude that the pathological conditions in children's mouths are not essentially different from those in the adult, but early treatment renders results more easily obtained. Studying to put ourselves in the child's place and viewing the case with his eyes may with a reasonable amount of persuasion and exhibition of pleasing results save a compromise which would militate against success.

Dr. T. L. Grisamore:

I want to compliment the essayist upon bringing to us at this time this very interesting, instructive and timely message.

To my mind there is no phase of dentistry, the importance of which should be impressed upon the mind of the dental profession, more than the care of children's teeth. When these teeth are cared for properly, the cases requiring Orthodontic treatment will be materially reduced. The attendance and scholarship of many pupils in the lower grades of our schools will be decidedly increased and a large percentage of all children will be in better physical condition.

It is best to keep all deciduous teeth in place until their successors are ready to take their places. A reduction by decay, or otherwise of the mesio-distal diameter of cuspids and molars should be prevented. We all know it is not possible in all cases to obtain the desired results with these little patients, but there are certain teeth in the deciduous denture which it is absolutely necessary, from the Orthodontist viewpoint at least, to retain in position: These are the deciduous second molars and cuspids.

While the deciduous second molars are in position, the oncoming permanent first molars must force their way between the rami of the lower and the tuberosity of the upper. It will be much better for the development of the arches if both deciduous molars are in position during this developmental period, but it can readily be seen that the results will not be nearly so injurious from the loss of the deciduous first molars as it would be from the deciduous second molars.

If the deciduous second molars are lost early, when the permanent first molars erupt they will drift forward and occupy the space that should be occupied by the deciduous second molars. As the first bi-cuspids are the next permanent teeth to erupt, they will very likely drift distally to some extent at least, and as a consequence there will not be sufficient space for the second bicuspid. The ultimate result is an impacted or mal-aligned second bicuspid, or under some conditions a protrusion of the entire denture.

Another very important function these teeth have to perform, is maintaining the relation of the jaws during this developmental period. If they are lost before the first permanent molars are fully erupted, there is nothing to hold this relation, except the deciduous first molars, which are at best, very poor teeth to depend upon for such an important function.

The deciduous cuspids are often prematurely lost either by their roots being absorbed or by extraction. Cases often present with the incisors coming in crowded and mal-aligned, and sometimes the parents insisting upon the extraction of teeth to relieve this crowded condition. The operator, under these conditions, will occasionally extract the deciduous cuspids long before time for the permanent cuspids to erupt. While such practice will relieve the crowded condition of the incisors, it prevents the developing and expanding of the anterior part of the arch.

After this simple operation has been performed, there is no means left by which nature can gain sufficient space for the permanent cuspid teeth. If the incisors were not in a crowded condition and the cuspids were prematurely lost, this space would gradually close. The muscles of the lip will tend to force the anterior teeth distally, while the erupting force of the molar teeth will tend to force the posterior teeth mesially, resulting in a narrow arch, with the lateral incisor in contact, or nearly so, with the first bicuspid. The cuspids will eventually be either mal-aligned or impacted.

If it is at all possible, the deciduous cuspids and second molars should be kept in position until time for the eruption of the second bicuspids and permanent cuspids, and if not possible to retain them the space should be maintained by some mechanical device.

While I heartily agree with the essayist in most of his statements pertaining to Orthodontia, its causes, treatment, etc., his recommendation to extract the first permanent molars between the years of nine and eleven should be followed with the greatest caution, after careful examination, and only when the operator is firmly convinced that the usual evil results which follow the extraction of these teeth will not take place.

Dr. M. D. K. Bremner, Chicago:

First, I want to congratulate the essayist on his very able paper upon a subject that is very interesting. Children are interesting beings and anything pertaining to them is always of interest to us. The reason for treating children's teeth as a special subject for discussion is really not that their teeth themselves differ so much from those of the adult, but rather that children themselves are different. In other words, you have to treat a psychologically different person from that of an adult. The adult will adjust himself to circumstances, a child will not. Of course it is a nice thing if you can also adjust yourself to your grown-up patients, but if not, you can get along somehow. Not so with a child. Either you get on with him or you do not. I think the essayist sounded the key-note when he said that nine-tenths of our failures are caused by not being in tune with the child. The first thing needed in handling children is tact, but tact, like genius, is born, not made. You have it, or you don't. One thing, however, you must have, and that is confidence of the child and absolute confidence. This does not mean that you let him boss you, but he must know that what you say is absolutely true. The child reasons in the concrete, not in the abstract. You can tell a grown-up person, "This will not hurt," and if you do not keep your word the grown-up person will excuse you; but the child will say, "Now, you have lied," and you will continue to be a liar to him forever and ever.

I will carry this point a little farther. Do not say to the child, "I am going to hurt you, and it will last just a little while." "A little while" does not mean anything to a child, especially a very young child. If I have to hurt a child I will say, "It is going to hurt, I will count ten, and then I will stop." The child knows exactly how long it takes to count ten, and he can steel himself to stand it for that length of time. The essayist says we must not try to do the same for a child as for an adult, and he is right.

We all know the value of painless dentistry—of nitrous oxid analgesia, or anesthesia, etc., but it is not so much painless dentistry as fearless dentistry that we need. The greatest drawback in getting people into the chair is not so much pain, as fear of pain, and when a child comes into our office at the most impressionable age it is not only important that we do our work well, but that we do not inculcate fear in the heart of the child for dentists and dentistry. That is most important.

I have made it a rule, in fact, that wherever there is no pain, that is, where the child is not suffering from toothache, never to work the first time, but rather to get the child acquainted with the instruments and surroundings, get it acquainted with the chair, the hot air syringe, the water syringe, take hold of the engine and let the child see it work, sometimes grinding a little on the finger nail and thus show that there is nothing to be afraid of, and then send him away. When he comes next day he is not afraid and that does away with a good deal of the trouble.

The essayist has spoken of a typical case where a child comes in and you remove the superficial decay, if not with an excavator, with a small bur, and it works fine; but that is different from a child who has had toothache for three or four days and is very irritable so that you can hardly look at it. In such cases nitrous oxid works better than anything I know of. I use my rubber nosepiece, and put a few drops of perfume into it, it does not take long and it is not much trouble, you do not have to worry about blood-pressure, and you can clean out the tooth and do good work. I think nitrous oxid is one of the best things in these cases.

The essayist mentioned about the use of hydrogen peroxid. I believe a word of caution is necessary. You must be sure that the tooth is open, because if not you will have considerable trouble, as the gas is apt to force infection into the apical space.

He also says that he does not use canal points. I would not go quite so strong. I do use them sometimes, only one must keep in mind the time that the roots begin to absorb. It is useless to try to fill a root that is half absorbed. For the last two years, however, I have been filling these roots with bismuth subnitrate and 5% of Thymol Iodid powder made by Wampole. I have a syringe (Parke-Davis) and use a large needle. I put a little piece of red rubber over the point and then cover the pulp chamber with cement. So far the results have been very good. I have not X-rayed them, but I have had no come-backs.

One point in the treatment of children's teeth that the essayist did not touch is the use of copper amalgam. In cases where you cannot remove all of the decay the copper amalgam works wonderfully for it undoubtedly limits decay. That is also true of copper cement. I have for years used black cement but since red cement came out I have used that. The red is supposed to be as good as black, and does not discolor the teeth.

The essayist spoke of the capping of pulps in the first permanent molar. I have done that often and find it works very well. I believe the reason of our success in capping these molars in young children is primarily due to the fact that these root canals are large, the apices have not yet been constricted, and the pulps have better circulation, and owing to this fact I imagine they can withstand more than the pulps in an adult's teeth, but generally I try not to expose the pulp. Occasionally, the first permanent molar comes and it is nothing but a shell of enamel. In these cases I take out the decay, leaving the decalcified dentin, and put in a dressing of creosote, a dry dressing which sterilizes the tooth, then I fill it with red copper cement, and I have had very few failures. It kept the tooth until the child was thirteen to fourteen, and then I devitalized it. In this manner I prolonged the life of the pulp and gave the tooth a chance to mature and get harder.

Another important point that the essayist brought out was the pre-digested food, and the soft food. In the light of our present knowledge I think this should receive careful consideration. We do not know what decay is—what causes it. We do know, however, that the savage is very nearly immune. Certainly the fact is that the savage does not have as much decay as civilized man. The food of the savage must be in some way responsible for this, and the especial characteristic of savage food is that it contains roots and herbs in which are quantities of hard cellulose fibers. He must chew pretty hard. If the theory that teeth which are smooth are not permeable—and Bunting claims he has tried to force silver nitrate into perfectly polished teeth and it did not penetrate—then we must say that the savage is practicing prophylaxis every time he eats.

This has an important bearing on the treatment of children's teeth,.for if, according to Pickerill and others unerupted teeth are more porous than those that have been in the mouth for some time, we can see the importance of the child chewing hard food, because the child's teeth, being more porous, this hard food will consolidate the enamel surface and prevent carries. Of course it is only a theory, but nevertheless it is something to think on.

There is another phase: Take the subject of the vitamins. We all know that beriberi has been caused by people eating polished rice. We find that polyneuritis in birds is caused by the same thing, and that they can be cured by feeding them unpolished rice. These vitamins are not substances of nutrition, but have something to do with the secretions.

The Governor said the dentists could teach the bakers something. Yes! the first thing we should teach them is to bake more whole wheat bread and rye bread that contains the life of the wheat, and less white bread. We ought to instruct our patients to eat coarse food, whole wheat bread and foods that have not been denatured and predigested.

Still another problem was brought out this afternoon, and the essayist just touched upon it, and that is the importance of the work we do for young children. The boys and girls playing around our doorstep today, he says, represent the men and women of tomorrow. Every time this is brought up to me it always spoils the afternoon for me. A patient comes in with a child, and I find there is a lot of work to do, but they cannot afford to pay what I ought to charge. Here is the proposition: In the case of a grown-up person who cannot pay my price, I refuse him, and I salve my conscience by saying that he was not provident, that he did not save his money, that he was not energetic enough, and so on. But when a child comes, and asks me to give him a chance in life, what am I to do? If I decide in favor of this child I decide against my child and family. I do not always decide in favor of the poor boy or girl, but when I don't, it gives me a very peculiar feeling. Someone spoke of the Forsyth and Eastman institutions, and that philanthropy is all right, as far as it goes, but I really agree with Tolstoi when he says that "the best thing the rich can do for the poor is to get off their backs." This is where we as citizens belonging to the great middle class should use our influence to see to it that justice is done these people who are not getting it.

Dr. G. W. Dittmar, Chicago:

The paper was a very excellent one, as was also the discussion so far. There are, however, two or three things that I want to take exception to. I think the paper did not start quite early enough in the treatment of children's teeth. It seems to me that the dentist should perform an important function for many children when they are erupting teeth. Many children suffer severely, their whole nervous system is more or less affected during the time the teeth erupt, and if dentists were called upon and did their duty by simply lancing the gums it would relieve the child as well as every member of the family. I know this from personal experience with two of my children. I have performed this little operation numerous times with the most gratifying results where children were running a high temperature, were really very sick, upon the verge of convulsions, and within a few hours after the gums were lanced were almost well. A very simple operation, but one that must be performed with care and caution on the part of the operator.

I wish to second what Doctor Grisamore said in regard to extraction of the first permanent molars.

Just a word regarding the filling of the roots of deciduous teeth. The essayist and some others have treated this subject a little differently from the way I generally treat it, although I do not pretend to be an authority. When I know that the root is all there (we should know the time that the root of each deciduous tooth, as a rule, starts to be absorbed, which is usually about three years before it is shed), I treat that tooth just as I would a permanent tooth. I clean the pulp chamber and root canals and fill with guttapercha points. But if I know there is absorption and the root half gone I would then do about as the essayist indicated.

Dr. James D. MacMillan (Macomb):

What is the appearance and condition of these gums? Usually swollen and tense, hard, and sometimes a little colored. I do not think we should lance too early. I think harm might result from lancing gums before we should, because of the scar tissue which forms. But we frequently see that swollen, tense condition over an erupting tooth which can be relieved immediately by lancing.

Dr. John S. Reece (Bloomington):

There is a question that confronts us a great many times, and that is in regard to the eighty-five per cent who do not visit the dentist. How are we going to instruct these people or give them to understand the necessity and the importance of filling these teeth and keeping them clean? Some dentists say this: "If I go to the school board and ask them if I can come to their Mothers' Club to make a talk, they will think I am trying to fill my pocket book."

The advertising man in a great many towns is about the only man that is saying anything, particularly to those who do not visit the dentist, about the care of teeth. I would like to have somebody suggest how we are going to reach that class properly.

Dr. P. A. Pyper (Pontiac):

I wish to take just a minute of your time in considering Dr. Reece's question, in regard to the eighty-five per cent who never have dental work done. If you will excuse the personal reference, I will tell you how we have been trying to get at that class in Livingston County.

The County Anti-Tuberculosis Society has inaugurated an Anti-Campaign by hiring a trained nurse who with the assistance of the local medical and dental men is making a full medical and dental examination of all the school children. Since last fall we have examined all the children in every city and village in the county, and are now busy in the country schools. The demands for her services are greater than she can possibly meet before school closes. I think this is the solution of the problem as here are all of the future generation.

The nurse doing or arranging for this work eliminates the "personal gain" cry from the public. The nurse is welcome in every instance and has never been turned down, and it gives her an opportunity to meet and give suggestions and advice to the parents.

A survey two months after the examination in some of our schools shows that fifty to seventy-five per cent of the defects found at examination time were corrected or arrangements had been made for their correction. This work will in time, I believe, greatly reduce the eighty-five per cent.

Dr. G. D. Sitherwood (Bloomington):

I would like to speak along the same line with Doctor Pyper. Last week we had what we called a "Better Babies" week in Bloomington. We examined the teeth of four hundred babies. The first two days we looked at the mouths of children not more than ten to twenty-three months old, and the last day of this contest we looked at the teeth of children about four and a half years old, and in many of these mouths we found from two to five teeth decayed. The surprising thing to me was that we only found one mother who thought it was necessary to have anything whatever done to the decayed teeth. So here is a great field of education and of work for the dentist.

Dr. H. P. Bachman (Decatur):

I want to go Doctor Dittmar one better on the starting of the child, and that is to start with the mother before the child is born in regard to the development of the teeth. An impoverished mother cannot have a well-developed child.

I had a little experience this spring in a baby contest, and I found children just beginning to erupt, their teeth showing that during the start of the development of these teeth there was a lack of proper nourishment. So there is a good opening for instruction to the public in regard to proper nourishment for mothers.

The handling of children is a big thing. I find the easiest way is never to talk about the tooth to the child. Talk about anything but the tooth. If the child is old enough, ask him if he goes to school or similar question—anything to get his mind off the tooth, and you will not have trouble except in rare cases.

Dr. L. B. Torrence (closing):

I want to just make a statement. I want to say that this paper did not come before the Society at my suggestion at all. Just a month or so ago the program committee wrote me and told me they wanted me to write a paper on the treatment of children's teeth. If I had selected a subject it would not have been this, although I consider it a very important one, and one that should be before dental societies oftener than it is. The reason that I should have selected some other subject is because this is not my hobby, and I believe that we can ride our hobbies better than other subjects.

I have no criticism to make of the discussion. I would like to say to Dr. Grisamore, however, that I do not extract all the first permanent molars that come to me; only those that are broken down and where there is nothing left but the root.

Another thing that was brought out in the discussion, was the filling of these teeth with canal points. Let me assure you it is absolutely unnecessary to put a canal point in a deciduous tooth; you can fill them as I have indicated and you will not have any trouble, and not only that, you will have perfect absorption when the time comes..

I hope if any of you have any children's teeth to fill you will try this method. I certainly desire to thank all the gentlemen who have participated in the discussion of this paper, and if this paper has benefited you any, I can say with Mark Twain, "To be good is noble; to teach others to be good is nobler—and less trouble."

DISCUSSION OF DR. WM. H. G. LOGAN'S PAPER "CHRONIC ORAL INFECTIONS ASSOCIATED WITH TEETH."

GEORGE D. SITHERWOOD, Bloomington, Ill.

The paper of Dr. Logan is of a far-reaching character, both from a scientific and practical standpoint. He has set a high mark for every dentist that takes pride in his profession and who has the welfare of humanity at heart. If the blood examination as conducted by him is of real value, it has been presented in a very positive and convincing manner.

The dental profession is no doubt ready to accept the teaching of the eminent authorities which he mentions on the etiologic relation existing between chronic focal infections and many chronic systemic diseases in so far as the findings are based on actual facts, the foundation on which all scientific research must stand.

"The Transmutation of Bacteria," as enunciated by Dr. E. C. Rosenow, i. e., the transforming of the streptococcus into a pneumococcus or vice versa, is borne out by many facts relative to the behavior of bacteria in different environments. Just what relation such a transformation may bear in these chronic affections is rather obscure.

A noted investigator has said: "The pathogenic microbes are not instruments of a perfidious Providence, and created to chastise man, animals and plants. The pathogenic species are the result of selection and adaptation. They grew first of all as saprophytes on individuals who suffered no damage, as is the case today with many bacteria growing on animal bodies." But humanity in our time, as the result of changing conditions, and a far different environment, is obliged to combat these bacteria in their present form.

"The elective localization of streptococi," given us by Dr. Rosenow, is of the greatest significance. He says: "The general systemic distribution of micro-organisms in certain diseases with a localized focus is well established, but the factors which determine the localization of bacteria after they gain entrance into the circulation are obscure." Then his closing statement: "The results, (which were stated by the essayist), seem to bring the necessary experimental proof that chronic foci of infection play a most important role in causing systemic disease, a fact which has been frequently commented on by different observers, but has been recognized in its full clinical significance especially by Dr. Billings, 1912. A focus, such as a pocket in the tonsil which cannot heal for mechanical reasons and which is constantly filled with pus and necrotic material, teeming with bacteria, must be regarded in the light of all these findings as a culture tube with a permeable wall affording abundant opportunity for the entrance of bacteria and their products." Metchnikoff, director of the Pasteur Institute in Paris, has brought to our notice what is known as the "Selective fixation of toxins." For a toxin to kill in the minimum dose it must possess a selective affinity for certain cells whose function is of vital importance, and must proceed to fix itself on these cells and not on others when introduced into the circulation, as is known to take place in the medullary nucleus, which only needs to attract to itself a few milligrams of tetanus toxin in order to throw a man into violent convulsions. The degree of intoxication by any toxin or bacteria is dependent on its power of fixation.

When the fixation power is low, the body may contain very much toxin, without any apparent effect on the general health, while a small amount of toxin with a high fixation power is very serious in its actions. This to my mind is the explanation of the serious disturbance in those cases mentioned by the essayist of periapical infection without a discharging sinus. On the other hand it is well known that a focal infection may exist for years walled off to such an extent that there is not enough bacteria produced or toxins manufactured and absorbed into the circulation to overcome the resistance the body has for them. In other words there is lacking the power of fixation on any particular organ of the body. They are, therefore, neutralized and as far as any constitutional symptoms are concerned are not doing any damage. Then it happens that a new organism enters into the case, and the original bacterial products offer a fine culture media and food material for the visitor, and he in turn contaminates the original organism to such an extent that a new form of bacteria is produced which, when taken into the circulation overcomes all resistance and neutralization offered to it, with the result that the patient suffers from an old and apparently harmless focal infection, suddenly made active and serious.

Something of this order takes place when root canals have been imperfectly filled and the bacteria and their toxins walled off for a considerable length of time and then in a few moments the bacteria become aggressively active. There is no doubt, however, that there are hundreds of foci of infection in every individual that never becomes active, or give any apparent trouble, but in time take care of themselves by self sterilization. If it were not so we would all die young. It is because of this fact that so many dentists and physicians are still indifferent to the great importance of combating the existence of the micro organisms inhabiting our bodies, which have set going there a poison factory, which cuts short our existence by secreting poison which penetrates all our tissues, injuring our most precious organs, our nerves, arteries, brain, liver and kidneys.

The long series of blood findings, undertaken and completed by the essayist and presented to us tonight both orally and visually, are of the greatest scientific value. The hope is here expressed that he may continue until this method of diagnosing the injury that occurs from these obscure foci, may be of equal if not superior value to that of radiography, which at present is our greatest single help. However, the opinion still prevails among many careful practitioners that in order to correctly diagnose cases of focal infection from the teeth which cannot be readily done by ordinary examination, that it is necessary to take radiographs of all suspected areas in and about the jaws, make cultures of the pathogenic bacteria from pyorrhea pockets or alveolar abscesses that may be present, making tests on animals with the cultures of the bacteria found. In fact making the laboratory tests prove that such disturbances are caused from the foci in the oral cavity. They can now add to these the hematin test.

While it is quite true that formerly the physicians who made a diagnosis of these cases using radiographs almost to the exclusion of other evidence, recommended the wholesale extraction of all infected or pulpless teeth, their enthusiasm has somewhat cooled in the last year or more, and they are now quite ready to consult with the dentist and pursue a more sensible course, realizing that the radiograph is sometimes a gay deceiver, the operator often making a picture of something that does not really exist.

At the present time, at least, in Central Illinois the most cordial relations exist between the dentists and physicians, a condition which benefits both professions and the community at large.

In regard to the dentist accepting the responsibility of controlling these chronic cases, it will only be possible when patient, dentist and physician are in accord and work together with a real purpose to effect a cure. By such a course it will be easier to arrive at an understanding, as to the length of time that may be necessary for diseased areas to return to the normal, before resorting to extraction and using surgical means for the eliminating of all danger of reinfection. In this connection good heed should be given to the very wise suggestion and warning of the essayist to not extract too many teeth at one time, thereby causing sometimes very serious results.

At the last meeting of the McLean Co. Dental Society in April at Pontiac, Illinois, Dr. A. B. Middleton, one of the leading surgeons of that city, presented this same subject under a somewhat different caption. He gave the history of quite a number of practical cases that were very interesting and I think the presentation of a few of them in this discussion may be of some practical benefit. Through the courtesy and permission of Dr. Middleton three representative cases are presented.

Case 1. A man aged 40 was referred by a medical man for the removal of his tonsils, but upon examination the tonsils appeared to be healthy and did not show signs of the slightest infection, and the sinuses were normal, but for two years he had been bothered very much with pyorrhea, and his dentist had been treating them regularly since the first signs of trouble, but the patient had noticed upon several occasions following the cleaning of his teeth, that his rheumatism would be very bad for about ten days, so he called the attention of this fact to his dentist who assured him that this trouble was due to his sitting in the dental chair for a considerable length of time at each treatment, a thing to which he was not accustomed. The dentist said this was a typical case of pyorrhea, but that he had noticed in particular that one tooth always had very much yellow pus about it, but it did not arouse his suspicions, as such a condition was not an unusual thing in cases of this kind. The tooth was not painful or loose, therefore, there certainly should not be anything wrong with the process, yet a radiograph was made and a distinct alveolar abscess was found at the end of the same tooth that had pus around it. A culture taken from the tooth fistula and one from the gums proved to be of the same organism, "streptococcus longus." This tooth was later drawn, the mouth kept absolutely clean and in a short time his arthritis began to improve, the constipation became better and in a few months the supposed pyorrhea, that had been so faithfully treated, left without further treatment. Therefore, there are two things of great value in this case, first the so-called pyorrhea, no doubt was not pyorrhea, but a streptococcus gingvitis, that was being constantly fed by the emigration of organisms from this focus of infection, which was nothing more than a culture oven, growing organisms as fast as it could, and second the toxin or bacteria taken into the circulation was just great enough to bring about slight rheumatic pains, under ordinary conditions, but when the pyorrhea was treated, a certain number of lymphatics were opened no doubt, that took up enough extra toxic material to bring about an increase of sensory nerve disturbance, which explains the aggravated rheumatism following each dental treatment.

Case 2. A business man aged 48, in 1910 came for glasses. The eyes were found to be normal, but the usual error in refraction for near work was present. Three years later however, he returned with both conjunctiva red and hyperemic, but no discharge present, and no organisms could be found, but the eyes were painful to touch and he could not stand the light. One week later a low grade inflammation developed in the deeper layers of both cornea, and this condition persisted for several months, during which time no organisms were to be found. The vision fell to 20/300 but he continued to be able to tell form and color. At times the eyes were very red around the cornea. The pupils finally became contracted and a few months later a cloud came over his eyes making it impossible for him to see but little more than light. The interior of the eye appeared to be one inflammatory mass, but at times they would clear up temporarily, with a slight return of vision. This fluctuating condition continued until everything that could be suggested as a possible cause in the whole field of ophthalmology had to be dropped by exclusion, when by accident the thought came to have his mouth thoroughly examined by a dentist, as he was developing slight adenitis, which is nothing more than the swelling of the cervical glands in the neck. Two dentists after examination pronounced his teeth to be in fine shape but something seemed to say try a radiograph, and one was made which revealed a crowned molar over the site of a large walled off alveolar abscess. After properly draining this cavity there was a remarkable cessation in all the symptoms, and in less than two months without further treatment he returned to his work with comfort and pleasure, using the same glasses that were fit for him two years before. In this case the toxic substance seemed to have a particular affinity or fixation for the tissues of the eyes that they could not stand, therefore general uveitis developed which promptly recovered of its own accord as soon as the cause was removed.

Case No. 3. A lady, age 56, afflicted with intolerable pain on the right side of the face for seven years,.had seen a number of specialists and all of them had diagnosed her trouble as ticdoloureux and she had upon a number of occasions been advised to have her gasserian ganglion removed on that side. The essayist had also given her the same advice, and preparations were being made for the removal of the ganglion. The following Thursday, when a dentist happened to call, relative to another case, he was through courtesy asked to look at her teeth and she told him that all of her lower teeth had been out for more than ten years, but he suggested another radiograph be made, and as a result of his advice, a congenitally misplaced unerupted tooth was found buried far back in the angle of the lower jaw, and lay in what appeared to be a cavity. This tooth was later removed and the facial pain left like magic, and the lady still has her ganglion. An unfortunate thing connected with this case is the fact that in the estimation of the old lady, the essayist is a wonder, while upon the other hand to the man that offered the suggestion and located her trouble, she does not give any credit whatever, even after all the particulars of the case were explained to her.

Dr. C. N. Johnson (Chicago):

Mr. President: I want first to express my personal gratification at the excellence of this paper of Doctor Logan. At this particular time it is a very important subject. The discussion that has arisen in connection with focal infections in the mouth and around the teeth has given rise to a great deal of misconception on the part not only of the dental profession, but of the medical profession, and this paper it seems to me will go a long way to correct this misconception. I predict that it will harmonize, more than any other single document with which I am familiar, an understanding between the men of the different professions.

One thing that Doctor Logan emphasized was the fact that after the extraction of these teeth there was grave danger of leaving foci of infection in the jaw after the case had apparently healed up. It leaves us in some uncertainty as to what our duty is in these cases. Up until now the impression has been in the minds of the profession that all that was necessary to eliminate that focus of infection was to extract the tooth. We have all, I believe, dismissed from our minds from that moment the possibility of danger, unless there was necrosis of the bone or something of that kind. I must confess that from clinical observation I am still unconvinced that a large percentage of these cases remain infected after the extraction of teeth. Because if that were true in any great number of cases, we have left a lot of mischief after our operations. It seems to me that clinical observations show that these cases heal up and the patients get better after the extraction of teeth. That is something that will have to be dcided by scientific investigation of the type that Doctor Logan is carrying on.

I was surprised at some of Doctor Logan's findings—that leucopenia was present more often than leucocytosis in pyorrhea cases; also that in only 48 out of 110 cases of pyorrhea were there abnormal blood findings. It would seem that open pockets containing pus are much less likely to affect the blood pressure than closed pockets, because 98 out of 108 cases of periapical infections showed abnormality of the blood. I want to emphasize one thing, and that is that we are not justified in making a conclusion in all these cases simply from clinical observation, or the radiograph; we must go further and consider the relative condition of the blood, the evidence of the skiagraphs, and the clinical findings. It seems to me with that whole routine we may clear up many of these cases that previously have left us somewhat a sea.

At the conclusion of the paper the essayist referred particularly to the relation of the medical man to the dentist in connection with the management of these cases. That is a question which is today very prominently before us, and there has recently been more friction than should have been the case with two professions working for the benefit of the people. Medical men have sent patients to have teeth extracted without any consultation whatever with the dentist, and there has been some irritation developed. I myself have been placed in a position where I had to oppose the judgment of the physician, when it seemed to me to be for the benefit of the patient.

But I am inclined to look with a great deal of charity upon the medical man who is confronted with ill health in an individual, and is looking for something that will account for it. He has probably eliminated many of the other things which might bring on ill health, so he concludes that probably the tonsils or teeth are about the only things left to account for the disorder, and having in his mind the one thing of getting his patient well, he naturally orders the elimination of that thing which seems the causative factor. That is a perfectly natural position to take, and the only criticism I have to make is that the medical man sometimes ignores the dental practitioner and orders the extraction of teeth that are not at fault. I believe a closer consultation, an appeal from the members of the dental profession to the members of the medical profession to take more carefully into consideration these things before passing snap judgment, will clear up this whole situation so that very soon we shall have a conference of the two professions over these difficulties that shall redound to the best interests of the patient. This is not a matter, ladies and gentlemen, of the prestige of the dental profession, or the prerogatives of the medical profession; it is a matter of the best interests of the patient, and we are not going to serve the best interests of the patient until we as dentists, and they as medical men, confer on these things, until we meet medical men half way and they meet us half way, and when we do I think they will acknowledge to us that in many infections of the mouth they are not as well informed as we, and we must acknowledge that we have not as broad a point of view on physical conditions as they, but by bringing about this combination with each other I believe that in the near future the people of this country will be better served than they have been in the past.

I want to compliment Doctor Logan on his paper. I think it is the most comprehensive, scientific and satisfactory paper on this subject that I have ever heard.

Dr. T. L. Gilmer (Chicago):

Mr. Chairman, Doctor Logan, and Gentlemen of the Illinois State Dental Society: This paper has interested me, and I congratulate the Society on having had a paper of this kind. Scientific papers like this cost their writers much time, and not a little knowledge is necessary to write such a paper. Doctor Logan has been studying this subject from blood examinations and the results of his labors are valuable. For a number of years I have been studying focal infections of the jaws from the bacteriological side, and have gained information which I deem valuable, at least I have profited by the study. I wish that all dentists might take up similar studies. Should they do so I believe that they would find it not only pleasant but profitable.

The blood picture is one that is variable even in health. The numerical relation between the blood cells is marked in certain diseases. In chronic infections there is often so little relative difference in the nominal numerical relation of the cellular elements of the blood, that it is difficult to determine whether the difference is caused by the infection or is normal. It may represent simply the variability in healthy individuals at different times. The number of leucocytes may be considerably increased after meals, which is normal. These facts must all be taken into consideration in examination of the blood, otherwise normal changes may at times be supposed to represent pathological conditions, when in fact they are not significant. The essayist is fully cognizant of these facts. We should view these subjects from every side, therefore I am pleased with Dr. Logan's work.

Dr. Sitherwood spoke of the formation of toxins manufactured in apical abscesses and attributed to these poisons, rheumatism and other diseases. It is not so much the toxins formed in chronic abscesses that cause rheumatism and other pathological conditions, but rather the organisms which escape from these so-called walled-in abscesses or pus cavities in the jaws. These organisms pass from the abscess through the blood or lymph channels to the joints, the heart or other parts, and it is to the bacteria we attribute the various secondary manifestations. It is well known that subsequent to an acute attack of tonsilitis a diffuse nephritis often follows, also that occasionally following surgical operations septic emboli are carried by the blood streams and set up secondary infections in some remote parts of the body. If this is a fact, may it not also be true that bacteria escaping from an apical abscess may do the same thing? The reason I believe so strongly that chronic alveolar abscesses are dangerous is because I have frequently seen neuritis, joint and other secondary infections subside, following the eradication of an abscess in the jaw.

In my study of the bacteriology of alveolar abscess I found the predominating organisms to be the streptococcus viridans. If we inject the organisms taken from chronic alveolar abscesses into animals we cause a variety of diseases. Then when we collect the bacteria from the diseased areas caused in the animals we invariably recover the same organism which was inoculated into the animals, that is, the streptococcus viridans.

If one has had an arthritis of sufficiently long standing so that the tissues composing the affected joint have undergone such degenerative changes, that they cannot be restored to their normal function, we must not anticipate more than arrest of further changes. Again, we may remove all jaw foci and still the patient may not be cured. In such cases the jaw infection may be only one of the contributing causes, additional foci in the nose, tonsils, or other parts may be sufficient to continue the secondary disease. If the patient is to be relieved of secondary manifestations all foci, wherever situated, must be sought out and eradicated.

I would offer a word of caution relative to the extraction of too many infected teeth at one time. Several patients have been known to lose their lives as a result. A little of my own experience as an illustration. A patient came to me with two very badly abscessed teeth of the chronic type. I removed them and secured a specimen, from which cultures were made. The organisms found proved to be the streptococcus viridans. Rabbits were inoculated with the pure cultures obtained. The animals all died in thirty-six hours after inoculation. In two days after the removal of the teeth for the patient referred to, I was called to see her. She had a high temperature and was quite ill. Had I removed a half-dozen or more teeth I might have killed my patient. By the removal of the teeth the barriers which had partially walled in the bacteria, were destroyed, and a bacteriaemia resulted. The organisms from the specimen secured were morphologically and microscopically seemingly identical with other specimens from similar jaw abscesses. In this instance the bacteria were evidently more virulent than those ordinarily found in jaw abscesses.

DR. G. W. DITTMAR (Chicago):

We will all agree that this is a very remarkable and learned paper and shows a great deal of study and work. I cannot add anything, but this question comes to my mind. Suppose we have a patient with a focal infection, say it is an alveolar abscess. We are told that bacteria from such abscesses get into the blood stream and are carried to certain locations in the body; for instance, the joints, the heart valves, and other places, and that they there produce inflammation, and sometimes suppuration. Then we are told that if we extract the tooth and eradicate the abscess, that the bacteria in these inflamed localities die. In other words, these bacteria that have escaped from this abscess and are harbored around the joints and produce inflammation, because the tooth is extracted and the abscessed area curetted, these other bacteria in other parts of the body all give up and die. Now that is to me a conundrum. I may be dense and ignorant, but it seems to me the argument that has been advanced leads us to believe that very thing.

Another thing. We have heard a number of terms tonight with which I am not familiar, but I believe the essayist and some of the others also, used terms that are not applied exactly right. There were two terms used interchangeably—radiogram and radiograph. Now radiogram and radiograph are two entirely different things in my understanding. A radiogram is a wireless message and a radiograph is a shadow picture, a skiagraph.

Dr. Arthur G. Smith (Peoria):

Mr. President and Fellow Members: I cannot add anything to the scientific side of this paper. This is a case where the "cat may look at the king," and I am the cat. The thing I am going to talk about is a little bit of evidence that I wish to offer so that some other man will not be caught in the same way I was recently.

A very competent physician, an eye specialist, was confronted by the horrible disaster of a patient steadily going blind, and submitted to me a radiograph which he and the radiographer who had taken it said demonstrated a thin and attenuated area about the lower third molar, said lower third molar being the sole posterior support of a fairly well constructed bridge which was the only useful piece of masticatory apparatus owned by that individual on the lower jaw. These gentlemen, far more learned in the interpretation of radiographs than I am, insisted that these were the conditions present and asked me if my skill was sufficient to wreck this Brooklyn and remove this infected tooth. I took myself and my few instruments to the hospital. In a room, gentlemen, where this man had remained without a ray of God's sunlight for twenty-eight days, I removed that bridge, and I removed that tooth, and found a perfectly healthy pulp. Now that was the pit into which I fell. My own interpretation of that radiograph would have been that it did not show anything in the world clearly and conclusively, and the next time that anyone whatsoever asks me to go far and away beyond what I can personally observe from a radiograph, I shall gently but firmly decline.

DR. ARTHUR D. BLACK (Chicago):

I wish to express my appreciation—in which I am sure I am joined by everyone here—of the splendid paper Doctor Logan has given us tonight. Papers of this type, which bring to us evidence of real work, help to advance our knowledge of problems of this kind. Whether a man learn much that is new or not, the undertaking of a problem of this kind with an open mind is beneficial. I think we are all coming to appreciate the fact that in the relation of mouth infection to systemic conditions, we are facing a tremendously complicated problem; that we have to deal with problems which are new in pathology, with most complicated problems in bacteriology, with very complicated local problems, all of which must be worked out before we may know the real situation.

If I were to endeavor to add anything to this paper it would be to mention certain conditions which present in practice, with which we may deal with the knowledge that we have before us. We could add almost numberless cases to those which have been cited here tonight; cases of myocarditis, of arthritis, of fearful headaches which have occurred periodically for months and which have disappeared soon after the removal of such foci. Cases of the particular types mentioned might be multiplied indefinitely in order to bring us to a fuller realization of this situation.

We have in the mouth certain foci which are capable of causing secondary systemic effects. These may be divided into three very definite groups: (1) The shelf of granulating tissue which underlies the deposits of salivary calculus on the surfaces of the teeth; (2) pus pockets alongside of the roots, and (3) the chronic alveolar abscess. Each of these has been proven to be a distinct menace to health and it seems to be clearly our duty to rid our patients' mouths of such foci.

In the light of all the evidence presented the duty of the dental profession is pretty clear. I do not believe, and I think from what Doctor Logan has said, he does not believe, that the radiograph of the bone about the end of the root which fails to show chronic abscess is always sufficient to warrant us in saying that the root end is safe. I have a number of cases which have been treated and subsequent radiographs have shown a condition which would be passed unquestioned as normal, but yet as a fact they are not safe, because I have followed these cases further and three or four months later a cavity will show in that bone again, and six months after that it will probably be healed up again. The fact that the bone is close enough to the root so that the radiograph does not show a cavity does not prove that the trouble is not there. It is therefore not certainly safe to carry cases along on radiographic findings alone. A very little detachment of the membrane around the end of a root can be just as dangerous as a tolerably large cavity, because such a little chronic focus may feed as much of infection into the circulation as a large one. We should not base our action in these cases on radiographs alone. The man who does will extract a lot of teeth that he should not, because radiographs are by no means infallible. We must take every item of evidence we can get.

I might cite one case. A rhinologist ordered an upper first molar extracted in a case of maxillary sinus infection, and the patient came and asked me about it. I tested all the teeth on that side above and they all had vital pulps except the first bicuspid, and none had pus pockets. The bone about the first bicuspid appeared normal, but there was a spot in the radiograph over the first molar, the pulp of which was vital. I had two more radiographs made and the abscess was not there. Often radiographs of the same area from two different angles will not show the same. I have several radiographs which show what appear to be very definite abscess cavities right at the ends of roots of teeth which have vital pulps, and radiographs taken later do not show these spots. There is so much that we do not know about this question of chronic alveolar abscess and root canal conditions, that we need to be careful and to study thoroughly all of the means of diagnosis at our command.

There are some things in Doctor Logan's paper which I think might leave an impression which he did not intend to convey, and one was that a large number of cases were curetted where there were abscesses, at the same time the tooth was extracted. That may be Doctor Logan's practice, but it has not been mine, because I question whether we would be justified in curetting an abscessed cavity around the root of a tooth, on account of systemic danger. Personally, I should prefer in the average case to omit, for the time being at least, the curetting, and return to it later if necessary, watching the case with subsequent radiographs.

I want to emphasize all that has been said by both Doctor Logan and Doctor Gilmer as to the danger of extracting very many teeth of this type at one sitting, and to add that the systemic danger may be reduced in cases in which there are pus pockets alongside roots, if these are thoroughly irrigated before extracting.

Dr. Logan (closing):

In my opinion infections do not often remain after teeth are extracted and the tissues heal over. That they have done so we have positive evidence.

Few cases need curettement. Most cases will get along and care for themselves without curettement. In some cases it is indicated, but the percentage is small. I often pack with gauze to the end of the socket to prevent blood-clot from forming there and retaining the bacterial products, by using gauze having paste upon it.

What are some of the findings we must take into account when called upon to decide whether a tooth involved with infection can or cannot be retained? Opinions differ. If a patient has a bad secondary involvement, the infected area around the root end of the tooth even though small, is not an indication for root amputation or treatm through the tooth; in that instance I would extract the tooth. If the patient were suffering from slight neuritis or rheumatism, and the involvement was not large, and you thought the pericementum was alive over the root end, I believe you would be warranted in treating the tooth through the root canal. If you thought you could make out there had been some absorption of the end of that root, I think it would be wrong to try to save that tooth by treatment. If this same patient had a heart lesion, or joint lesions, I would not stop to treat the tooth, but I would remove it. I would remove, it Doctor Dittmar, for the same reason a surgeon must remove a finger if the swelling extends up the arm, and the patient's life is threatened, thinking that Nature could take care of part of the infection if I cut off the major part of the supply. If a patient has an iritis it is not good judgment to prolong the life of a diseased tooth in the jaw. If the patient has a moderate blood pressure and no albumin, I would not keep an extensively or moderately diseased pyorrheal tooth in the mouth. It is known that a chronic focal infection is liable to produce nephritis. If the blood examination is normal; if the blood pressure is normal; if the urinanalysis is normal, you have a right to go along and see what you can do on the border line cases. But you have no right to treat these cases that are beyond the border line.

At the present time all the evidence we have is that bone may build around the root end in these rarefied areas but we have no evidence the pericemental membrane is in between. I hope our belief is wrong. But until then I will keep on the safe side every time, and when the blood examination and urinanalysis indicate the effects of focal infections I will take out most of these teeth.

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EDITORIAL.

THE BALANCE WHEEL.

The thing most needed among dentists, individually and collectively, is balance. If we look back over the literature of the profession even for a single decade we are impressed with this fact. Strewn along the roadway of professional progress we see the wrecks of theories which in their time held complete sway over the minds of the profession. It seems so difficult for the average practitioner to preserve his balance and use his judgment when any new idea is exploited in our literature. Time and time again we have been presented with the spectacle of a palpable fad swaying the profession like a will-o'-the-wisp, and landing it at last in the mire of disappointment and discomfiture. Where the bell-wether jumps the whole flock follows. When the craze is on a general stampede occurs, and woe betide the man who has the balance or courage to stand out in the middle of the road and try to stop the rush.

It may be a new cure for pyorrhea which holds the boards; it may be the dictum that "no tooth should be extracted unless it can be taken out with the thumb and finger;" it may be cataphoresis; it may be crown-work or bridgework; it may be porcelain inlays, or pulp-capping, or analgesia; it may be serum therapy, oral prophylaxis, or focal infections at the root ends of all pulpless teeth.

No matter what the subject is that gets a lead in our literature it is done to death. And invariably many men go off at a tangent and carry to the extremity of foolishness every new idea that strikes their fancy. It is often said that good comes from all these extremes, and this is in a sense perfectly true; but the trouble is that in carrying any line of practice to an extreme more harm invariably results than good. In the past the confidence of the public has too frequently been shaken by the following of false gods on the part of dental practitioners.

No new idea which appeals in any sense to the reason should be discarded without due deliberation, because it may contain the germ of a very important truth; neither should every new idea be swallowed willy-nilly and accepted as gospel till it has reasonably been tried in the balance.

The marvel is that with the spectacle of so many fads fallen by the wayside the profession should not learn the lesson of deliberation. What most of us need is a balance wheel.

BOOK REVIEWS.

ESSENTIALS OF OPERATIVE DENTISTRY.

By W. Clyde Davis, M. D., D. D. S., Dean and Professor of Operative Dentistry and Technic, Lincoln Dental College, Lincoln, Nebraska. Second Revised Edition. 334 pages. Published by the C. V. Mosby Company, St. Louis, Mo.

This book has undergone such a complete revision and enlargement at the hands of the author since the first edition that it comes out practically as a new book. It now contains 180 illustrations, which by the way, are very well made, and much additional reading matter. The author treats his subjects in a brief and concise manner with the evident idea of not wasting his reader's time, and this in itself is something to recommend the volume. Those who were familiar with the previous edition will find much improvement in this, and those who have never seen the book will do well to read it.

CORRESPONDENCE.

Erie, Pa., August 7, 1916.

C. N. Johnson, M. A., L. D. S., D. D. S.,
Editor of The Dental Review.

My Dear Dr. Johnson:

You may be somewhat astonished to hear me state that Anterior

Poliomyelitis—Infantile Paralysis—is of dental origin, dental irritation, reflex in character, traumatic in results.

For the past ten years I have been giving this paralysis proposition an unusual amount of study and a most rigid clinical investigation.

I have satisfied myself beyond any question of a doubt that the affliction or malady is due to pathological dentition, atrophying and putrescent tooth pulps.

I have arrived at this positive knowledge of the subject from an extended clinical experience. Having recognized pathological dentition, atrophying and putrescent tooth pulps, I removed what I recognized as a profound constitutional disturbance, and was astonished to witness the paralyzed subjects make speedy recovery to normal condition. I stand prepared to prove to the scientific world that the malady is purely of dental origin, reflex in character, traumatic in results.

No baby, child, youth or adult is in any danger of becoming afflicted, providing they are free of pathological dentition, atrophying and putrescent tooth pulps.

The only exception to the paralysis cases not making a speedy recovery, are cases where the reflected injury to the central nervous system was too long maintained previous to the real cause being removed, then we get what is known as a residual paralysis, atrophied or wasting limbs. When the medical profession and scientific investigators take up the dental aspect of this anterior Poliomyelitis subject, and acquire a comprehensive knowledge of *reflexes* of the fifth, pair of cranial nerves, they will speedily arrive at an absolutely correct solution of this paralysis malady.

Sincerely yours,

G. W. Cochran, D. D. S.

The Editor Dental Review.
Dear Sir:

May I trespass upon your valuable space, to correct an impression that may arise from a translation by Dr. C. M. Smith of part of an article of mine on pyorrhea, published in the *Cosmos* in November, 1915.

In the July issue of your journal, Dr. Smith states that extraction is contraindicated by me, in pyorrhea, because absorption of bone still persists after extraction.

The mistake has arisen, I think, owing to nomenclature since I look upon pyorrhea as that stage of periodontitis where pus exists. I tried to point out that this was the final stage of the disease, and while I may not have said so, I admit that it is sometimes the only recourse, and am compelled to extract in many cases. If we extract we obliterate the pockets and sepsis must disappear. Peridontitis, as it is known in England, begins with an absorption of the tooth socket. This absorption goes on more rapidly than absorption or recession of gum, which, having nothing to cling or adhere to, causes the pockets to form, and sepsis follows, causing pyorrhea.

Though extraction will remove this septic condition, I still hold that absorption of bone continues and is evident in the mouths of these patients years afterwards, since it is slow in progress.

Dr. Smith holds that if necrosis is not present, absorption will not occur. I don't think this is in accordance with either teaching or facts. I would suggest as evidence the difference in the angle of the mandible in old age as compared with angle in youth. There is a marked difference, and as text books tell us that this bone ceases to grow at 16 years, the difference can only be due to loss of bone tissue by absorption, further there is no evidence of necrosis.

Absorption of bone can be produced by pressure, or by poor or enfeebled circulation, and also by irritation. Osteoclasts may be present without necrosis supervening.

Thanking you for your courtesy, I have the honor to be,

Sir, very faithfully yours,
FERDINAND BYRNE, L. D. S. and D. M. S.

9 Welbeck St., London, W. July 19th, 1916.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Instrument for Carving Wax:—One of the best instruments for carving and contouring inlays, etc., is a No. 1 S. S. W. Scaler.—*J. F. Nelson, Washington, Iowa.*

For Reaching Deep Distal Cavities With Cotton Pellet or Canal Point:—Heat and bend points of an extra pair of foil carrius at right angle on curve of circumference of a dime.—*J. T. Search, Onarga, Ill.*

Useless Horn Mallets:—Most of the mallets furnished students for adapting metal plates to models are useless because one end of the horn is too small to be effective and the other too large to reach down in the palate of the model. The remedy is to saw off the small end until it is three-quarters of an inch in diameter and round it off with a file. This will improve its working qualities.—L. P. Haskell, Chicago.

Inserting Silicious Fillings:—To get the best results a mixing bottle should be used with a thermometer inside whereby the desired temperature may be maintained by filling the bottle from the hot or cold water at the wash-bowl. When inserted the hardening process may be hastened by flowing hot paraffin over the filling. All such fillings should be kept free from moisture till the chemical combination of the ingredients is complete.—*Edmund Noyes, Chicago.*

M. O. D. Restorations With Inlays:—These inlay restorations are often deficient at the gingival wall despite the care one takes in the manipulation of the wax. Take a slow setting amalgam and put a smear on the inlay where it refuses to come up. Now seat your inlay. Smooth off surplus amalgam, remove and set with cement at once. Should the amalgam refuse to adhere to the inlay cut undercut in inlay for retention, in which case a quick setting amalgam is best. This avoids the cement joint and is applicable to inlays other than gold. The same type in gold can be made in sections or use synthetic porcelain instead of amalgam.—*E. J. Perry, Washington, Iowa.*

A Serviceable Dummy:—Sometimes we are called upon to put a dummy tooth in place of a broken root, but patient cannot wait to have absorption take place. Get abutments ready for the bridge, take impression and notice the size of the root to be extracted. Hollow this out in the plaster model and set the dummy tooth into this socket made in the model, about one-third the depth of the natural root, having everything clean and smooth as it can be made. Have the root extracted and immediately or at least the same day, insert bridge with dummy tooth set into this newly extracted socket. The gum healing around the tooth, leaves no unsightly condition which we have where the tooth is set against the outside of the gum.—*C. E. Allshouse, Chicago.*

Balances for Amalgam:—To get right proportion of mercury and alloy make balances as follows: Make two small cone shape pans, solder same to the ends of small rod about four inches long. Place fulcrum at point from center of pans equal to the proportion wanted of alloy and mercury, for example; if the proportion is five to seven, divide the space from center of one pan to center of the other into twelve parts and place fulcrum bar at point seven parts from one and five from the other. Then add solder to balance the pans when empty. Make small base for fulcrum bar to rest on and coat pans with varnish, or paint that the mercury will not adhere to it. Place mercury in short arm and alloy in long and you will have the desired proportion of seven parts mercury to five of alloy.—*E. T. Evans, Decatur, Ill.*

MEMORANDA

The Northeastern Dental Association will meet at Foot Guard Armory, Hartford, Conn., on October 11, 12, 13, 1916. A very interesting meeting is being planned and a large attendance is expected.—Alvin A. Hunt, Secretary.

PATENTS RELATING TO DENTISTRY.

1126949. Filling teeth, Georges A. Brouillet, Brookline, Mass.

1128139. Toothbrush, John P. Hoffman, Albany, N. Y.
1127448. Slitters, Victor E. Jullien, Cincinnati, Ohio.
1127635. Dental impression tray, Robert M. Kerr, Detroit, Michigan.
1128045. Tooth cleaning device, Gustaf L. Reenstierna, Congers, N. Y.
1128664. Artificial denture, Wm. J. Curry, Vancouver, B. C. Canada.
1128876. Partial denture and removable bridge, Willis L. Hough, Laconia, N. H.
1128450. Selective dental disk-cutter, Fernando O. Jaques, Jr., Cranston, R. I.
1128703. Artificial tooth, Thomas G. McMahon, Winnetka, Ill.
46975. Design, Combined soap-dish and tooth-brush holder, Perry M. Shepard, Chicago, Ill.
1129335. Dental plate with rugae on the lingual side, George A. Critcherson, Los Angeles, Cal.
1129336. Rugae mold for dental plates, George A. Critcherson, Los Angeles, Cal.
1129476. Metal backing for teeth, Gustav E. Fritz, Chicago, Ill.
1129300. White enamel and the like, Ignaz Kreidl, Vienna, Austria-Hungary.
1130242. Appliance for regulating teeth, Dexter S. Bacon, Minneapolis, Minn.
1130892. Artificial tooth, John G. Dettinger, Jr., and F. H. Welker, Philadelphia, Pa.
1130716. Dental tool, Henry G. Dressel, Chicago, Ill.
1132326. Toothbrush, Joseph F. Fouyer, Marseille, France.
1131863. Toothbrush, Helene H. Phillips, Westchester county, N. Y.
1131802. Combined head and jaw rest, Nels P. Stenshoel, Crookston, Minn.
47100. Design, Tooth brush, Charles Boccla, New York, N. Y.
1132565. Dental instrument, Thomas D. Craig, Albia, Iowa.
1133250. Dentifrice, Wm. M. Ruthrauff, Tucson, Arizona.
1133907. Rotary toothbrush, Harry Allan, Toronton, Ont., Canada.
1133930. Toothbrush, Charles E. Carroll, Newport, Ark.
1133379. Dental matrix for approximal fillings, Jeptha G. Hollingsworth, Kansas City, Mo.
1133570. Retainer for dental plates, John S. Naulder, Pittsburgh, Pa.
1134017. Dental bite tray, Mastin E. Sanders, Rosenberg, Texas.
1133409. Dental mandrel, Silas E. Smith, Worcester, Mass.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

THE SOUTHERN CALIFORNIA ASSOCIATION OF DENTAL NURSES.

A great deal of interest and enthusiasm is being shown by the organization of the Southern California Association of Dental Nurses, which was organized with the idea of increasing the efficiency of the dental nurse. This association is the outgrowth of a clinic and afterwards a course of lectures given by Dr. Frank Holman, president of the Southern California Dental Association. These lectures and clinics were given at the University of Southern California Dental College, which were primarily for the benefit of the dentists, but the assistants who attended realized their inefficiency, and only by an organized effort and study could they perfect themselves to that height to which they aspired.

Dr. Frank Holman, president of the Southern California Dental Association, Dr. Bert Boyd, president of the Los Angeles County Dental Association, and Dr. J. C. Waterbury, vice-president of the Los Angeles County Dental Association, and one very well versed in the organization of societies, assisted this association in its organization.

The first meeting was held in the offices of Dr. Frank Holman in the Auditorium building, Los Angeles, Cal. The officers being as follows: President, M. Elizabeth Mitchell (dental nurse with Dr. Lewis E. Ford, Dean of the Dental College, U. S. C.). Vice-president, Sue Dickson (dental nurse with Dr. Louis Felsenthal). Secretary, Phyllis Keys (dental nurse with Dr. J. C. Montague). Treasurer, Helen Wood (dental nurse with Dr. J. Walter Grey). Editor, Edith Wilkerson (dental nurse with Dr. G. Maurice Crow).

The meetings are held the second Tuesday in each month at seven-thirty P. M., in the offices of different men of the profession who have extended invitations to the association.

At these meetings, papers of interest and value are read and discussed by the members. Different men of the profession who are present always speak along very instructive lines.

All who are members realize that they have been working in the dark before, and feel that they derive invaluable benefits from each meeting.

We have to date a membership of over thirty and new names are being added each month, due to the interest taken and benefits derived.

At the twentieth annual session of the Southern California Dental Association an invitation was extended to the Dental Nurses to have a Clinic. The Clinic showed the different steps followed in the daily routine of work in the efficient office, commencing with opening up the office in the morning, the meeting of the patient in the reception room, the assistance at the chair, the book-keeping, making appointments, the diplomacy used in answering the phone, the laboratory work, proper sterilization and closing the office. These different steps were shown by various members, each assuming a separate role dressed in the dental nurses uniform. However, all of these steps can be successfully followed and accomplished by one efficient dental nurse, along with the co-operation of her employer.

Great interest was shown in this clinic by members of the profession who heretofore were not in sympathy with the new movement, showing the height already attained by the association and the proof of its value to the profession. Dentists whose assistants have taken an active part in the work, now realize more than before the importance of their work as a dental nurse. The members of the Dental Nurses Association realize that the movement is only in its infancy and a great deal of pioneering must be experienced before the ideal, or goal to which they are aspiring, may be attained.

EDITH WILKERSON (Editor).

OBITUARY.

Dr. Charles Rudolph Edward Koch, the loved and honored secretary of Northwestern University Dental School, died Friday morning, July 21st, in Newtonville, Mass., at the home of his daughter, Mrs. Arthur M. Crain. Mrs. Koch arrived there a little time before his death.

His going leaves a very great vacancy in the administration of the Dental School, and in the activities, the public services and the comradeship of the fast diminishing ranks of the Grand Army of the Republic and the Loyal Legion. The following list of the most important events and services of his very active life is copied from "Who's Who in America" and the "Book of Chicagoans."

Born in Birnbaum, Polish Prussia, April 24th, 1844. Son of Augustus and Josephine (Von Lutz) Koch; brought to America in infancy; lived with parents in Manitowoc, Wis. Educated in public schools of Manitowoc till 1859, assisted in father's business 1856-9; employed on farm near Chicago 1859, and later student in dental office of Dr. Kennicott till August, 1862, when enlisted as a private in 72d Illinois Infantry, serving in northern Mississippi campaign, Yazoo Pass expedition, Vicksburg campaign and siege; detailed chief clerk in Gen. Ransom's headquarters Nov. 1863; appointed captain 49th U. S. Colored Infantry; detailed on staff of Lorenzo Thomas, adjt.-gen., organizing colored troops in southwest; rejoined command in February, 1864, serving with it in Louisiana until May, 1865; provost marshal, Yazoo City, Miss., May till August, 1865, western district of Mississippi, Vicksburg, Aug., 1865 till March, 1866, when he was mustered out. Married June 25th, 1868, Mrs. Sylvia K. Bigelow, daughter of Hon. Otis Adams, of Grafton, Mass.; children, Josephine Von Lutz (Mrs. Arthur M. Crain, Newtonville, Mass.) Florence Adams, who died in infancy, Alice Adams (Mrs. Charles P. Tobin, Chicago), Mabelle.

Rejoined Dr. Kennicott in 1866 and later his partner in practice of dentistry till 1871, then practiced alone till 1898. Organized and was captain of a company of Union Veterans, serving in labor riots of 1877, and when the Illinois National Guard was organized, with some other members of this company, enlisted as a private in First Infantry I. N. G., in August, 1877, became captain Company I., Oct., 1877, major, April 1886, lieut-col., Feb. 1888; colonel April, 1889. The armory on Michigan avenue was built during his service as colonel. Voluntarily retired Nov. 1893. Organized regiment at breaking out of Spanish war, 1898, which was accepted by the state, and maintained at his own expense over four months, but was finally disbanded and honorably discherged by act of legislature. He was a member of Geo. H. Thomas Post No. 5, G. A. R.; director of Cook County Memorial Hall Association; past post commander, past inspector-general, past adjutant-general department of Illinois; associate member Military Service Institute of the U. S.; member of the Loyal Legion (commander Illinois commandery 1908-9); member of Society of Army of Tennessee; member since 1901 and secretary Illinois Vicksburg Military Park Commission; president Vicksburg Military Statue Commission; president of Surviving Volunteer Officers of United States.

He was secretary in 1869-74 of the Chicago Dental Society and president in 1875. Secretary, and reporter and editor of annual publications of the Illinois State Dental Society 1871-75; president in 1877. He was military editor of Chicago Inter-Ocean 1880-82; he was secretary and president of the Illinois State Board of Dental Examiners, of which he was a member from 1886 to 1891; president of National Association of Dental Examiners in 1891.

Since January, 1904, he has been the honored and loved secretary of Northwestern University Dental School. He was president of the American Association of Dental Faculties in 1912. He received the honorary degree of Doctor of Dental Surgery from Washington University, St. Louis, Mo., in 1888. He was the author and editor of a History of Dentistry, published in 1909 by the National Art Publishing Co., Chicago. He also wrote "Illinois at Vicksburg," and "Recreations, Study and Research in Military History."

It is proper here to give a more extended account of his services in the Illinois State Dental Society. He joined the society in 1867 and attended thirty-six of the annual meetings. In 1871 he read a paper on dental caries; as mentioned previously he was made secretary in 1872 and served five years. He was president in 1877. In 1884 he read a paper. "The Illinois State Dental Society, What It Has Accomplished." In 1885-86-87 he made the reports for the committee on dental science and literature. In 1889 he read a history of the first twenty-five years of the society, and was a member of the committee on legislation. He served on that committee three years at that time and made the report in '91. In '94 he discussed at length Dr. Brophy's paper on dental colleges. In '95 he read a paper, "A Commentary on the Dental Law of 1881." In 1904 he read a paper, "The Advantages of Organization." This had reference to the proposed reorganization of the society which was accomplished soon after. In 1905 he was made chairman of the legislative committee and was reappointed each year till his death, and for twelve years in succession he made the reports for that committee. For the jubilee meeting in 1914 he wrote the diary of the society proceedings for the fifty years of its history. A reference to the Index of the Society Proceedings shows the incompleteness of the preceding enumeration. In particular he wrote a paper in 1873 on "Abrasion and Erosion," one in 1876 on "Eclecticism in Dental Practice." The president's address in 1877, and in 1880 "Treatment of Teeth With Dead Pulps." He served on other committees and made other reports besides those mentioned, and took part in many discussions.

This long and rather astonishing list of his public activities represents only the skeleton of his great services, the flesh and blood and nerve that covered this skeleton and inspired in his host of friends honor, respect, admiration and affection cannot be described in this paper. He was a very great man, great in the services he performed, great in the breadth and soundness of his judgment, great in the constancy of his friendships, and great in his patience and charity for the mistakes and faults of those over whom he had authority. For all those who knew him life is poorer by his loss.

EDMUND NOYES.

DR. JOHN B. MURPHY

The medical world was startled on August 12th to learn that the day before Dr. J. B. Murphy of Chicago, one of the leading surgeons of the world, had died at Mackinac Island, where he had gone to escape the depressing heat of his summer home at Wheaton, Illinois. Dr. Murphy was born at Appleton, Wis., December 21, 1857. His rise to the very top of his profession was a series of triumphs over obstacles which would have checked a less courageous man, and his life was an example to the young and faltering member of any profession. Though not a dentist he always took the keenest interest in dental matters, and was a frequent and honored guest at dental society meetings. He had appeared before the Chicago Dental Society and the Odontological Society of Chicago as essayist and speaker on several occasions, and he invariably left an impress on the members which will not soon be forgotten. The passing of any great man is always a distinct loss to the world, and in the death of Dr. Murphy at the full height of his greatest usefulness, not only the world of medicine but the world at large has suffered a loss irreparable.

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THE
DENTAL REVIEW.
Vol. XXX. CHICAGO, OCTOBER, 1916. No. 10

THE TREND OF OPERATIVE DENTISTRY.*

BY DR. J. V. CONZETT, DUBUQUE, IOWA.

Operative dentistry, like all other sciences, is the result of evolution. It is the survival of the fittest in methods, the result of natural selection in technical effort and the elimination of the unfit and out of date in instruments and materials. The operative dentist of today owes his present exalted position to the labors and studies of the men of the past. Not only to the men who have been operative dentists, but to all men who have sought to alleviate the suffering of men in regard to their dental conditions and to all scientists who have sought and found the secrets of nature and having found have freely given of the results of their unselfish labors for the benefit of humanity. No greater honor belongs to any man, no monument should rise higher than that devoted to the perpetuation of the memory and the deeds of men, living now and those long passed to their reward, who have with patient zeal and undaunted will sought until they found and having found, have gladly and freely given of the results of their labor to all men. Upon the labor of such men have we built securely and well. In our own profession we owe to the genius of G. V. Black, more than to any one man that the world has yet seen, a very large part of the knowledge we have built into the science of filling teeth. If I were to pause here and say that which is in my heart to say concerning that truly great man that has so recently passed beyond our ken, I would have no time to devote to the subject in hand. Suffice it to say that he was my ideal and inspiration, and if I have attained success in any degree in our beloved profession it is because I have followed as closely as my poor ability would permit, in the path he marked out. His writings were my professional bible, his words my models in my lectures, and his operations my ideals in all of the work I attempted to do for my patients. The writings I have been permitted to give to the profession, the lectures I have delivered to post and undergraduate students, and the work I have done for my patients all bear the indelible imprint of his influence upon my professional life. I consider G. V. Black the greatest dental scientist that has ever lived, and as long as I live his memory and his work will live in my heart and life.

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*Read before the Illinois State Dental Society, May, 1916.

Dr. Black took the chaotic methods of the past and systematized them in such a way that he brought order out of chaos and made it possible for us to definitely correlate methods and materials in an orderly manner that we might be able to get the best out of all that was good and bring it over into the realm of our own specialty. He sought out and made known to us the physical characteristics of the human teeth, thus laying the foundation for the work of Miller and Williams, who, building on the work of Dr. Black, gave us the bacterial plaque demonstration of the cause of caries. Dr. Black gave us his work on the management of the enamel margins, a work that was epoch making in its results, as was the announcement of the doctrine of extension for prevention, a pronouncement that has meant more for the salvation of teeth than anything that has ever been given to the profession, and though bitterly fought at the time, is today accepted by all up-to-date operative dentists. His work on the physical characteristics of gold and amalgam made a revolution in the methods of the use of these beneficent materials, and made possible operations that were impossible before. Time would fail me to enumerate his activities and I am not doing so to exalt his name or memory at this time, but simply in order to work out my thesis. One last thing that I wish to enumerate as Dr. Black's contribution to operative dentistry is his work on dental anatomy, and his showing us the correct form of the human tooth and his teaching that all operations should conform to the form of the natural tooth. This I believe is his greatest contribution to operative dentistry, one that has not been perfectly recognized in the past and is only now beginning to have its full share of recognition, but I venture to predict, as the days go by and we learn more we will more and more go back to that little book and the extracted teeth that we have saved that we may more clearly know the natural in attempting to restore that which was lost in whole or in part.

We have learned from the orthodontists, and particularly Dr. Angle, the importance of a perfect occlusion. That the formation of the jaws and teeth mean more than the mere appearance of the denture. Nature has worked out a plan that is not only harmonious but useful in the highest degree and when the harmony that spells perfect function is lost, beauty of dental and facial appearance goes with it. We now know that there is a perfect harmony between face and jaws and when through any defect in the denture there is a lack of dental adjustment there will be a corresponding loss of facial alignment. This knowledge makes us more careful in attempting the complete restoration of a tooth as to its contour and mesio-distal diameter, for if that is lost in any degree, there is a relative loss of occlusal adjustment. Again we learn from the orthodontist the importance of the occlusal restoration. From the prosthetist we have learned the importance of the study of occlusal forces and the relation of the occlusal planes to the retention of the denture, and the retention of the individual natural teeth as well. The pyorrhea specialist has laid emphasis upon the proper restoration of the interproximal space and the making of a perfectly unirritating margin at the gingivae. The histologist has given us the form of the enamel and has taught us the proper method of its protection when its continuity is broken. The pathologist has impressed us with the importance of the apical space and the danger that lies in the imperfect filling of the root canal. And so from every specialty of our profession have we been learning that the science of operative dentistry is not alone the art of removing the decay from a carious tooth and placing an impervious filling therein, but that it is a larger, nobler science and one that is fraught with the weal or woe of the entire organism. We have not only laid our own profession under contribution but have borrowed all we could from all of the sciences. Anatomy, Physiology, Chemistry, Metallurgy, Physics, Esthetics and Bacteriology, have all given of their knowledge and have brought us out into a larger place.

The operative dentist of the past was content to remove the decay and fill the hole in the tooth left by such removal, and if in so doing he saved the tooth he thought that his work was well done.

The old thought was individualistic, but with the larger perspective that time, experience and a knowledge of collateral sciences has given us we now become socialistic in our outlook and regard the tooth as a member of the human economy and work for a restoration of function rather than a mere saving of the tooth. Many a tooth has been saved in the past to the detriment of the masticatory efficiency of the dental organ and as a result, to the detriment of the organism as a whole. Such a saving is poor economy and the tooth had better have been sacrificed than to be retained as a menace to the whole process of mastication and its attendant functions. This is the outlook of the future operative dentist, the trend of the profession in the direction of operative dentisry.

When a cavity occurs in a tooth there is a loss of tooth structure, and nature immediately attempts to close ranks and keep the continuity of the arch unbroken, so there is a moving forward of the tooth, with a slight tipping motion that plays havoc with the occlusal planes of the opposing teeth and the septal tissue between the teeth. If the loss of structure is not great the movement will be correspondingly small and little damage will have resulted, but if there is a great loss of structure and a considerable movement of the teeth there will be a correspondingly great disturbance of occlusal balance and consequent septal irritation. The operator of today must take cognizance of such conditions and do all in his power to correct the evil. This can be done by separating the teeth until the proper mesio-distal space has been secured and then a filling placed that will restore the original shape and size of the tooth. This will bring the tooth in its proper occlusal position and will make it possible for it to do its share in elbowing the line to proper tight contact throughout the entire denture. In proportion to the loss of mesio-distal diameter of one or more teeth will be the resulting loose contacts with all of the train of evils attendant upon such a condition. In the restoration the contour must be faithfully followed and the interproximal space carefully restored. The study that has been given to pyorrhea of late has impressed us with the fact that the dentist in attempting to make a filling in the proximal surface of a tooth has frequenly done more harm than good, for in his failure to properly restore proximal contact, or proper contour or occlusal restoration, he has made possible the crowding of food into the septal space to the irritation of the delicate tissue there, with a resulting inflammation, infection, pyorrhea and loss of the tooth, and a possible grave injury to the health of the individual. Or he has failed to make a smooth gingival margin and there has resulted a gingivitis from such irritation with a following pyorrhea and loss of the tooth. Dr. Arthur Black made a very impressive demonstration of this phase of the subject several years ago, and by so doing has placed the entire profession in his debt. In collaboration with many other men he observed the cases of gingivitis that came under notice and to the shame of the profession be it said that in the large majority of cases the inception of the injury was caused by faulty dental operations. Whatever we may not know about pyorrhea this one thing we do know and that it is that the beginning thereof is irritation from some source and it is very much up to us as dentists to see that we are not contributing to the spread of this dread disease instead of helping to wipe it off the face of the earth. No matter how well a filling may be made, how perfecly it may fill the cavity, nor how well it may look, if it does not prevent the ingress of food into the interproximal space and thus make for a healthy condition of the septal tissue it is a failure and the sooner it is removed the better for the patient. I very frequently remove fillings and restore them with a properly made one for no other reason. Further, if there is a loss of contact without decay it is our duty to restore that contact even to the cutting of a cavity in an otherwise sound tooth, for it will be a matter of prevention to do so.

The shape and size of the tooth must be restored not only for its functional value but also as an esthetic necessity, for if the size and shape of a tooth are not restored it will not look well no matter how well it may be filled nor with what material. Dr. Black was the first to call our attention to this important reason for restoration of contour and his point is very well taken, as may be demonstrated by any individual at his own chair.

The gold inlay is one of the best things that has ever been given to the dental profession and I honor Dr. Taggart for his genius in perfecting it, but like all good things it is subject to abuse, and one of the most flagrant ones is the failure to obtain perfect gingival adaptation. There is no reason for such failure if a proper technique is obtained, but the fact is in a large number of cases it is evident that there is an overhang at the gingival margin and a resulting gingivitis. These faults should be carefully sought out and if there is an overhang correct it before cementation. This is an easy thing to do and if the operator will simply bear it in mind he will save himself much criticism and his patient a good deal of annoyance.

In the past we have been advised to restore the occlusal surface of the tooth as anatomically as it was possible for us to do so. We were impressed with the importance of the contact point and the marginal ridge, but not many of us, if any at all, went any farther in attempting to follow nature. This for the very good reason that with foil fillings it was a very difficult thing to do. Not an impossible one, however, for I have done it with the foil filling and what I can do any one can. With the advent of the inlay this became another matter, for now with the wax model and the carving of the inlay out of the mouth the restoration of pits, fissues, and sulci became a very easy matter. Dr. J. Lowe Young first emphasized the importance of the matter and taught us that it was not so much a matter of appearance as it was a matter of function. The restoration of the occlusal planes kept the teeth in proper occlusal relation and besides that made possible a proper comminution of food in mastication. There is another very important reason for restoring the pits and fissues on the occlusal surfaces of the teeth and that is the protection of the septal tissue. Often we would find that food would crowd in between teeth in which there seemed to be perfect contact and for a long time it puzzled some of us, until it was observed in these cases that the occlusal surface of the tooth was flat and that the bolus of food in mastication was being forced toward the proximal surface rather than from it, and as the marginal ridge was not emphasized, the food would force its way between the teeth and into the interproximal space. This is easily remedid by restoring the marginal ridge and the pits and fissues on the occluding surface of the tooth, for then the direction of the food mass in mastication is toward the center of the tooth and away from the proximal surface. In these cases I have frequently corrected distressing conditions of impaction of food between teeth by simply cutting the pits and fissues in the filling already in place and the difficulty was corrected. This can only be done of course in those cases in which the contact is firm. Recently at one of our study clubs one of the dentists present asked me about an inlay with which he was having trouble. Food was packing in between the teeth to such an extent that he was not using that side of his jaw at all in mastication. I found an inlay with a close contact, but a wide one, and on examination saw that the occlusal surface had been finished with a flat surface. I trimmed the contact a little to make it narrower and then carved the occlusal surface to form, with the pits and fissues reproduced as well as I could under the circumstances. He went home and ate a chicken dinner on that side of his mouth without a shred of food finding its way between the teeth, and during my stay in that city he continued using the tooth with perfect comfort. I only use this as an illustration of the importance of always restoring the occlusal surface of the tooth in order to maintain masticatory efficiency and as a preventative of the distressing condition of food impaction.

A great deal is being said today about the elimination of pain in dental operations, and the trend of the profession in this regard is in the right direction, but there is a word of caution that should be interjected. We must not make babies of our patients and make them think that they should not have to stand any pain. Pain is beneficent in some of its ministrations, and as a diagnostic aid cannot be dispensed with, but there is no necessity nowadays of torturing the poor victim as we had to do in the days gone by. A dentist that leaves his patient a nervous wreck after a dental operation today, is not fit for the position he holds as a purveyor to the peace of the community. I am not going into the relative merits of the different methods of inducing a state of analgesia. I will simply say that I do not find it necessary to subject my patients to the influence of drugs of various kinds to enable them to withstand the filling of the large majority of cavities. The use of instruments that are exquisitely sharp and the proper use of them enables a man to quickly and with little pain, excavate the large majority of cavities. I find it necessary to use an analgesic in not more than one per cent of my cases. The power of suggestion when properly employed is an agency that is wonderfully efficacious and is employed in my practice more than anything else, but to obtain the maximum efficiency in its use you must know that you can do it. Here, more than any place I know, confidence in your ability is demanded.

Know yourself and your ability to do a thing and the thing is more than half done, but approach the problem with a hesitating, doubtful manner, inwardly being afraid of your ability to accomplish the task, and the battle is half lost ere it is begun. Confidence can only come in this respect through frequent successes, and the successes will be interlarded with many failures at first, but with a knowledge that you can do what others do, and with the assurance of the soundness of the principle, you will first obtain the mastery of self and then the rest is easy. In the large majority of cases I find no difficulty, but occasionally I run across a patient that I cannot control and then it is necessary to use one of the analgesics, and in my practice nothing has worked better than the splendid desensitizing paste that Dr. Buckley has given us.

The principles that I depend upon in my ministrations to the ease of my patients are, first a confidence in my ability to do the work easily and with little pain, second, to perfectly sharp instruments and a proper instrumentation, third, to rapidity of operation; I rarely keep a patient in my chair more than half an hour, and most patients can stand a sitting of that length of time without any degree of exhaustion. But few patients can stand a half day's operation, no matter how light it may be, without an exhaustion that is very trying. More complaint has come to my ears concerning the length of time that dentists keep their patients in the chair than the pain inflicted durng the course of the operation. Learn to make every motion count. Study the modern methods of efficiency, keep your instruments where you can reach them and be sure that they are always there, and in a condition to be used to the best advantage, know what you are going to do in every case that you begin and then immediately do it. Don't pick up one instrument, try it, discard, pick up another one, discard, and so on through the operation. Know what you are going to do, have a picture in your mind of the finished product before you make a stroke and know just how you are going to obtain that result, and every instrument you are going to use in the method and you will be surprised to see how quickly and easily the task has been accomplished. All of this will not come in a day, but the result obtained in thus systematizing your operations will more than repay you for the time and energy expended in getting the result. The trend of operative dentistry is in the direction of operations more quickly and easily performed and the men who are able to measure up to the standard of modern efficiency are the men who are going to be in demand; the other fellows will have to subsist on the crumbs that fall from the table of the fellow that knows how and knows that he knows it.

Modern pathology has laid a good deal of emphasis upon focal infections and has in many instances placed the blame for systemic infections upon the dentist that made slovenly operations upon root canals. We find upon radiographic examination many conditions of apical abscess and improper root fillings that are the suspected cause of physical disturbances, and the trend of the profession is in the direction of better root canal work. This is one of the best movements that has ever been put up to the profession and if it will prevent the slipshod methods that have been prevalent for too long a time, an incalculable amount of good will have been accomplished for the profession and humanity in general. In my visits to dental colleges I have frequently been shocked to see the manner in which root canal work was being done by the students. The canals were opened with no regard to the exclusion of saliva and canal cleansers pumped through saliva and contained debris in an effort to clean the canal, little realizing the fact that they were in danger of introducing organisms that were more virulent than the ones they were trying to dislodge. And then the canals are filled in this condition. Is it any wonder that we have a multitude of focal infections? A canal should never be opened and allow the fluids of the mouth to penetrate it, and particularly is this the case in the filling of the canals. A root canal should never be filled without placing the rubber dam, for in no other way can we be sure that we have excluded the contaminations of the mouth. In making a root canal filling I always place the dam and then wash the teeth with the tincture of iodin which I wash off with alcohol, dry the field of operation and then, and not until then, open the cavity. The instruments used are always sterile and are never touched with the hands. Broaches and cotton on them are previously sterilized and the barbed broaches are kept in an antiseptic solution while the operation is in progress. The smooth broaches for carrying the cotton are previously wrapped with the cotton and then broach and cotton are sterilized and placed in a container until wanted. I always have a number of such broaches ready so that no time is lost during the operation. Dr. Noyes has told us and other observers have corroborated his testimony, and I have found many such cases in extracted teeth that have been properly filled, that in certain cases the cementum will seal over the apical foramen after the pulp has been removed. Nature makes no mistakes, and what she will do once she may safely be expected to do again under the same conditions, and if we can reproduce the proper conditions we may be sure that we will have a sealing over of the apical end of our pulpless teeth and thus an end of any danger of infection from the contents of the tooth. I am not in a position to definitely say just what that condition is, but from clinical experience and from some studies I have been making I am convinced in my own mind that when a pulp has been aseptically removed and no irritating agent has been placed in the root canal that nature will take care of the end of the root, and while I am always careful to fill the canal as nearly as possible, I am not as much concerned about the perfect filling of the canal as I am of its aseptic condition, for I think that the apical foramen will be sealed in aseptic non-irritated canals as well if the root is not perfectly filled as if it is. Further, I would rather an aseptic canal was not perfectly filled to the apex than have the filling protrude beyond the canal, for that would forever preclude the healing of nature. This is a good subject for further research and I hope that some competent person will take it up and give us a definite positive answer, for it involves a great deal in the progress of our root canal work.

Finally the trend of operative dentistry is in the direction of esthetics. The things that were tolerated and even considered beautiful a decade ago are absolutely taboo now. We are trying to get away from the display of masses of gold that are visible to the eye. But we are having a hard time doing it and making permanent operations. Gold is still the king of filling materials and where we are making utility and permanence paramount we naturally turn to gold. Happily the era of the gold shell crown upon any teeth in front of the molars is past and is only used by men of little skill or less conscience. The porcelain crown, both the dowel and jacket, are strong enough when properly made to take the place of the natural teeth, so there is no excuse for using the disfiguring gold shell crown. But in fillings it is different; porcelain inlays have been a disappointment and are very rarely used. The silicates are better in appearance and where the patient is willing to have them replaced occasionally, are a decided advance over gold in appearance; but we must not lay claim to permanence in our operations when using them, for the permanent silicate has not yet been developed.

The restoration of the shape of the tooth has been mentioned and by way of emphasis I want to repeat that if the size and shape of the tooth is not reproduced it will make no difference what the tooth may be filled with the result will be far from beautiful. Better a gold restoration with all of its inharmony of color, if it properly reproduces the size and shape of the tooth making for harmony of its position in the arch, than a filling that perfectly reproduces the color of the tooth but by reason of a failure to restore contour makes an ugly appearance in relation to the other teeth in the arch.

The trend of operative dentistry is in the direction of the restoration of function and the establishing of harmonious relations between the individual teeth and their masticatory allies and any means that will enable us to more perfectly realize that ideal will be gladly welcomed by all progressive operators.

THE PRESENT TREND OF CROWN AND BRIDGE WORK*

BY DR. J. H. PROTHERO, CHICAGO, ILL.

To form a just conception of the present trend of crown and bridge work, a brief review of past ideas and methods, the hopes and fears, the successes and failures of the pioneers in this field, must by way of comparison be presented.

Modern crown and bridge methods had their inception less than fifty years ago. In the May number 1869 of the *Missouri Dental Journal,* Dr. W. N. Morrison described the two-piece gold shell crown. In the June number of the same Journal Dr. G. V. Black described the combined gold and porcelain crown with screw dowel, for anterior teeth. This was followed in the July number of the *American Journal of Dental Science* with a description by Dr. J. B. Bean of a similar crown having a split dowel.

All three types of crowns were new and decided improvements over the then existing forms in common use. The one striking feature of all three crowns was that they could, without modification, have served as abutments for bridges. They were not, however, for a number of years employed for such purposes; not until dire necessity, occasioned by many failures of early bridges, demanded their use. They were the prototypes of many of the present forms of crowns—notably the gold shell, and the Richmond crown of today.

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The modern method of replacing missing single teeth originated with Dr. B. J. Bing, of Paris. In the October 1869 Cosmos, Dr. H. D. Bennett describes this method in part as follows:

"My attention has lately been called to a new method of inserting teeth. Where four or five are needed in various positions in the arch, they are all attached to a small bar of gold about midway between the point and base of the teeth, so that they may be very readily kept clean around the gums, and the two ends of the bar are plugged into the adjoining natural teeth by means of a griff. I have been shown a number of these cases by Dr. B. J. Bing of this city, the originator of this novel method of inserting teeth, and in each case I have found the patients delighted. The most difficult of these cases are the superior incisors; for example if you wish to insert a central, a cavity must be made in the palatine depression of the adjoining central and also the lateral, and one in the approximal surface of either of these teeth about the place where we usually find decay on these surfaces.

"An impression is then taken which will show these cavities, and a gum or plate tooth carefully fitted and backed with gold, observing the precaution of allowing a small point of the backing to extend into the approximal cavity; two little griffes are then soldered to the base of the backing, the ends of which are carefully plugged into the palatine cavities, with gold foil, in such manner as will tend to draw the teeth very slightly together, or at least not force them asunder as might be the case were this precaution not taken.

"When this operation is carefully performed for an intelligent patient, the result is always very gratifying, as none of the attachments can be seen without close scrutiny of the glass. It is solid, stationary, and can be cleansed as well in the mouth as the natural teeth, and simply demonstrates the fact that two roots will support three crowns. I have seen a number of these cases which have been in the mouth for nearly a year, and which are perfectly solid and clean, as perfect as when first inserted."

Glorious hope to be derived from this method was thus held out to the unfortunate by the early bridge workers—a hope doomed to be shattered by the test of a few years time. Webb, Litch, Starr, and many others practiced the method as outlined. They fostered and encouraged its adoption, and wrote about it, only to find in their own practices later on that the anchorages were insufficient, and that dummies thus attached became dislodged or rotated under torsional strain.

Devitalization of one or both anchor teeth, and a staple for entering the root canals of the abutments to which the dummy was attached as a substitute for the short bar, was suggested by Dr. Webb in 1873. This modification overcame torsional strain, but did not insure a self-cleansing structure, so for hygienic reasons this form of anchorage was generally abandoned.

In the early 80's, bands encircling the anchor teeth to serve as abutments, were suggested as an improvement over the bar enclosed in fillings. This form of anchorage which originated with, or was improved by, the Etruscans some three thousand years ago, was covered by the Low bridge patents in 1881. The use of the band for bridge anchorage was decidedly disappointing.

For nearly twenty years after the introduction of the Bing appliance, progress in the field of bridge work was very slow. Dental literature contains scarcely any records of importance, certainly none which show much advancement over the bar and filling anchorage.

Beginning in the early part of the 80's new forms of crowns and improved methods of bridge application were brought forward with startling rapidity. In the December 1883 *Cosmos* Dr. J. L. Williams says: "In the lives of most of us there sometimes come moments when we catch glimpses of the grand possibilities of life. We feel that we are fettered by old traditions and hedged about by old customs. We would, with one sweep of the hand, brush away these cobwebs of time from about us, and go up to the mountain top, where the blood may leap under the rejuvenating influence of a purer atmosphere and the sunshine of eternal truth may rest upon our heads. But alas, our feet still cling to the heavy clay, the vision departs and we go plodding on as before. But these moments of mental elevation have a deep significance. . . . They are the first faint foregleams of a day which shall witness the triumph of order over disorder in the mind of man. . . . It is my purpose to describe in this paper the principles of a mechanical appliance, or, to speak somewhat more elegantly, a form of dental prosthesis, which is capable of being made of immeasurably greater value to humanity in the preservation of that condition of the mouth of which I have just spoken, than all other forms combined. . . . I refer to the so-called crown and bridge work, concerning which so much has been said and so little is really known.

Dr. Williams called attention to the objections urged against bridge work, and answered most of these satisfactorily, with clearness and a remarkably definite understanding of the underlying scientific facts as recognized today. Among the problems discussed, the following were most important:

Dangerous after effects on tissues from use of arsenic.

Liability of devitalised teeth when used as abutments, to be thrown off as foreign substances.

Additional stress brought upon abutment roots, from being required to do extra work might result in destruction of their attachment to the jaw.

Unhygienic conditions set up by the presence of fixed bridges.

To this latter problem considerable attention was devoted, for it seems that more or less opposition existed to the introduction of fixed bridge work. Very interesting indeed, is the article in the *Cosmos* of July 1883, by Dr. James E. Dexter, and to which Dr. Williams refers. The following are some of the objections advanced by Dr. Dexter:

"The bridge, so-called is an appliance only for partial cases, or for cases in which teeth and roots, or roots alone, remain *in situ*. It consists (generally) in capping or banding the remaining natural teeth, and ferruling or pivoting the remaining roots, and to these caps or pivots or both, attaching bands, bars, or straps of metal which connect in a series all the points of support, and upon these bands, bars, or straps fastening the desired substitutes. The whole is then placed in the mouth and *permanently fixed there,* in several ways.

"These general principles admit of numberless modifications. Thus Fauchard, in 1725, carved his denture from hippopotamus tusk, and passed screws through it into the roots upon which it rested. Register caused the ends of his connecting bars or straps to project into cavities in the natural teeth, and fastened them there with gold or other filling material. Low placed bands around remaining natural teeth, and cemented them in place after having soldered his bridge bars to them. The main principles of bridging are, broadly, to permanently place artificial teeth between remaining natural teeth and roots in such manner that the porcelain substitutes shall fill the spaces made vacant by nature, while resting upon and being held in place by the natural teeth; the porcelain teeth, in the older methods, resting with more or less pressure upon the gum, and in the later methods being raised quite clear of the gum and supported by the natural teeth or roots in the same manner that a bridge truss or floor rests upon its piers—hence the name given to the operation.

"This clearance of the gums has been made a point of first importance in the eulogy of fixed bridges, from the supposed facility for self-cleansing of the apparatus which it affords.

"But as a practical fact, permanent bridges are simply the *nastiest* things ever made to do duty as substitutes for nature's work. The spaces between the artificial teeth, crevices under backings, and the spaces under the bands or caps around or over the natural teeth (spaces which it is next to impossible ever to thoroughly and permanently eradicate) simply form a series of invisible and non-cleansable cess-pools in the mouth, for the reception, retention, and chemical disintegration of a continually renewed mass of debris formed and forced into these places during mastication. No brush, pick, wash, or other agent will practically affect these accumulations to any appreciable extent, or modify their harmful powers. They remain, in defiance of all efforts to the contrary, to taint the breath, to load the inspired air with noxious exhalations which go straight through the lungs to the blood to impair and even render poisonous the oral secretions which accompany the food to the stomach and thence to the general system, and to make the vaunted bridge a source of aversion, disgust, and discomfort, alike to the wearer and his friends. Nor is this the end of the bad consequences of bridging. The spaces between the caps or ferrules and the natural teeth, through their retention of the decaying debris, will almost certainly become, in time, the seats of decay of the natural teeth, with no possibility of even detection (much less arrest) of the lesion until the pangs of toothache or the crumbling of the tooth wall, followed by the necessary removal and destruction of the whole apparatus (in order to repair the damages) have formed for us a very forcible commentary on the 'beauties and advantages' of permanent bridge work. Finally, when we add to these discomforts and dangers the further risk of a very probable breakage of some of the porcelain teeth on the bridge, and the almost absolute impossibility of renewing the broken tooth except at the cost of remaking the entire appliance (for it must generally be destroyed to be removed from its place) I think we may consider that we have made out a very strong case against permanent bridge work as a practical oral appliance."

The views of these two eminent practitioners have been given thus fully, because they represent the extremes of opinion prevalent about thirty-five years ago in reference to fixed bridge work.

In the face of bitter opposition at first encountered, the writings of Williams and a few other men, together with exhibitions of well selected practical operations, brought fixed bridge work favorably to the attention of the profession.

Since 1885, progress in this field has been phenomenal. Where at that time bridge operations were confined to a few expert specialists, it is now considered a part of every student's education, and a necessary accomplishment of every practitioner, to be able to construct such restorations when indicated.

That in very many instances the fixed bridge is mis-applied, there can be no doubt. Furthermore, as long as the practitioner's judgment is fallible, will the mis-application of structures of this type continue.

On the other hand, in well selected cases fixed bridge work represents the ideal method of restoring missing natural teeth, as is shown in very many instances where such appliances have been worn for years with comfort and without any unfavorable results whatever.

The percentage of these favorable cases to which bridges of the fixed type may be safely applied, is considerably lower than is generally estimated. This fact, however, is gradually becoming recognized, and as a result fewer fixed bridges and more partial dentures of the removable type are being constructed now than formerly.

Within recent years, by means of the X-Ray, and other diagnostic measures, foci of infection within the oral cavity are frequently disclosed. Very often the infected areas surround the supporting roots of a fixed bridge or a crown. Very often they involve the roots of teeth which have never been subjected to operative or prosthetic procedures.

Invariably, however, when in juxtaposition to roots carrying crown or bridge structures, the infection is charged to the presence of the substitutes. No doubt in many cases, the facts will warrant such diagnosis. Excessive stress on the supporting roots, imperfectly fitted bands, assembling of the various units in bridges so as to form pockets incapable of being kept clean, with attending consequences, may be directly responsible for the pathological conditions; or the trouble may have had its inception in the preliminary treatment of the root.

It is believed by some that the use of arsenic as a devitalizing agent may account for some of the troubles which sooner or later develop in the periapical region. There is no way of gauging or limiting its action on pulp tissue, and the probabilities are that in some cases it is carried through the apex, beyond the reach of any neutralizing agent. This tissue thus acted upon, in time breaks down and furnishes a nidus for pathologic changes.

The filling of roots, at one time regarded as a comparatively simple operation, is now considered a doubtful one; since imperfectly filled roots foster apical troubles, particularly when such roots are subjected to extra stress, as in bridge abutments the greatest care should be exercised in performing this operation. When there is any perceptible weakness in a root and it cannot be brought to a condition of health and comfort, many refrain from utilizing it for a bridge support, where a few years ago a chance would have been taken in the hope that the trouble would later on disappear.

It is the opinion of the writer, based on observation and experience, that although in well selected cases fixed bridge work is a comparatively permanent and satisfactory method of lost tooth restoration, this means of restoration has many times in the past been grossly misapplied. Careful men in the profession recognize this fact and many cases which formerly they would have corrected by means of fixed bridges are now supplied with some of the many newer forms of removable structures, to the advantage of both their patients and themselves. In view of these facts the present trend of crown and bridge application is towards conservatism.

THE PREPARATION AND FILLING OF ROOT CANALS.*

BY EDGAR D. COOLIDGE, D.D.S., CHICAGO, ILL.

For many years the subject of treating and filling root canals has been studied in a somewhat indefinite way and has been considered with a peaceful satisfaction by a large part of the profession, each practitioner being quite content with his individual method, or technic, of handling root canals and ready to assert on most occasions that he has no trouble with that part of dentistry. It has been very common practice to "save every tooth" if the patient could be kept free from pain, this condition being the accepted requirement of success to a large extent. Little did any realize what a hotbed of infection might be located at the apex of a perfectly comfortable tooth, what a host of bodily disturbances might be traced to such a seeming insignificant place and all the time cause no apparent local disturbance. When Rosenow startled the medical and dental professions with his announcement that such conditions as gastritis, indigestion, intestinal disorders, ulcer of the stomach, colecystitis, appendicitis, anemia, goiter, endocarditis, arthritis, nephritis, and other systemic conditions among which are a general impairment of health and vigor may have their origin in a focus of infection at the apex of a tooth showing no local symptoms, he turned the searchlight upon this field in dentistry which has shown and will continue to show a shameful condition, under cover, but now, fortunately, not out of sight, until every practitioner has acquired a more thorough technic in this work. Several men who have written on this subject state that less than twenty per cent of pulpless teeth are free from infections and I have found a similar per cent in about four hundred cases recorded. Of these four hundred cases only five per cent show mechanically perfect fillings in the roots and half of these show evidence of infection in the apical tissue. This narrows the margin down to two and one-half per cent of perfect fillings. This statement doubtless appears to many as surprising and perhaps to some unbelievable. All partly filled roots do not show infection but one can never feel that they are as safe as those which are filled to the apex. I found about twenty per cent of such roots showing no signs of infection as far as radiographic interpretation could detect. What does this mean? Only one filled root in every five, that has been filled in the past, is free from infection as a result of imperfect work. On the other hand let me say that it is possible to fill at least eighty per cent of all teeth to the apex. Dr. M. L. Rhein states that only seven per cent of roots cannot be filled which of course is the same as saying that ninety-three per cent can be filled properly. Undoubtedly men who have given to this work as much study and energy as Dr. Rhein are able to fill a larger per cent of roots than the average practitioner, but much of this work is done and always will be done by the average man in general practice. There is no field in dentistry today that deals with more vital issues and has a closer relation to the health and efficiency of the individual than does that of handling root canals and the exacting requirements of patience, skill and judgment furnish a field of vast enough proportions to justify many men devoting their entire time to the pursuit of this work as a special branch of dentistry.

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*Read before the Illinois State Dental Society, May, 1916.

SOME OF THE PROBLEMS IN ROOT CANAL PREPARATION.

If we accept the statement, for the present at least, that there are from seven to twenty per cent of teeth which have root canals that cannot be properly cleaned and filled what are we to do with them and how are we to know when such a statement as "this tooth should be extracted" is the only thing to say? If the future proves that all canals filled to the apex with gutta percha under strict aseptic conditions are free from infection, areas of bone absorption and other symptoms of local foci then we may conclude that this treatment is all that is necessary and strive to improve our technic enough to narrow down the per cent of unfillable roots. At this present time this thought is promising and offers the most hopeful solution. However another problem enters root canal work which has not been considered in the past. When we inspect a number of decalcified teeth the canals of which have been previously stained to make them opaque and the tooth structure made translucent, they reveal many branches of the main canals and often several foramina along the sides of the roots as well as on the end and sometimes have no opening at the very apex of the root at all. A very large per cent of roots show this condition present, a fact which increases the difficulties attending this work and places more severe requirements upon perfect root canal filling. Unless the organic matter can be removed and the canal thoroughly filled there will always be a danger point at that place. In cases where the roots are bent at such angles that no instruments available at the present time can be successfully used to open the canals it would be better to extract the tooth than leave it to become a future focus of infection. Frequently molars and bicuspids and sometimes any root will show a bad curve in the apical third. If these conditions are located by radiographs before an operation is begun it should be a very strong influence in determining whether or not the pulp should be involved. Many pulps may be saved that in past years have been removed and every possible treatment for preserving healthy pulps should be encouraged. There are two general classes of teeth in which canal operations are to be performed.

VITAL TEETH.

Of vital teeth there are those with a single straight pulp canal without calcification and having a single foramen. These should offer no hindrance to being perfectly filled and put into a safe condition. There are teeth having multiple foramina. We cannot always close all these openings, but thorough cleaning and filling will eliminate at least the largest and perhaps all of them. The crooked roots are difficult to handle and some are impossible. Dr. Ottolengui states that "the more canals men try to fill the more canals will be filled," which is true. Many canals with crooked roots can be filled and the more ability we develop the more teeth we can save. The roots showing calcifications are difficult and sometimes impossible but here again as with crooked roots ability and patience count to a great extent.

NON-VITAL TEETH.

When non-vital teeth are to be considered all the difficulties found in vital teeth will be found, plus infection. Destroying infection in root canals and placing them in a healthy condition is a problem in itself but the mechanical curretting, enlarging and cleaning of canals previous to filling is a great factor in freeing them of infectious material. The use of acid and alkali in the operation is also a great factor in removing infectious material and is equally as important as that of sealing strong antiseptic treatments in the root. Every partially filled root canal may contain infectious material as well as cement, gutta percha, broken broaches, etc., which are sometimes serious obstacles interfering with a perfect operation. To remove cement the acid treatment is the most useful, while acid will not dissolve gutta percha. Xylol or chloroform are solvents for gutta percha and a small pick or spiral broach will soon work its way through to the open space beyond when the canal is flooded with one of these drugs.

REGENERATION OF THE TISSUE IN ABSORBED AREAS

The root surrounded by an area of absorbed bone is in a serious condition and freeing it from infection and curing it is somewhat uncertain without amputation and currettement or extraction and currettement. However, many of these areas will fill in around the end of the root following treatment and perfect root filling. This regenerated tissue appears in the radiograph the same as that which is in a healthy condition. If the root is denuded and the fibres of the peridental membrane destroyed about the apex, re-attachment is hardly possible; however healing may occur about the root end as it does about a bullet, or gutta percha left in the apical region in over-filled roots or, as seen around absorbing deciduous roots which were previously filled with gutta percha. If the root is cleaned from infection and has not been roughened by absorption, after a good root filling has been placed, the tissue will fill in this area so as to appear normal in the radiograph.

In considering the subject of root canal treatment one of the first thoughts that come to mind is why this most important part of dental service has been so unsuccessfully handled in the past while the other branches of the work have been developed to a very high standard of efficiency. Had the partly filled roots and improperly treated canals given a large per cent of pain locally, there is little doubt but better work would have been done. But the fact that mild antiseptics, mummifying pastes, and other preparations would maintain a condition of comfort locally when sealed in the pulp chamber or root canal has been a great curse to the profession and a misfortune to humanity. That many remedies of this type are as yet on the market is a shameful evidence that there is still a great demand for them. The radiograph is indispensable in good root canal work. Before the advent of this feature we had no accurate means of determining the length of a root or the condition about the end of it. Uncertainty entered much of the work and it was only the exceptional case that could be treated and filled with any degree of accuracy. Another feature that has been added to modern root canal work is asepsis.

ASEPSIS.

Asepsis in surgery has eliminated much of the danger following operations and has greatly increased the percentage of success. The extreme precautions taken in surgical operating rooms in establishing and maintaining asepsis must surely impress the thoughtful and conscientious operator of pulp surgery with the importance of equal precautions in the treatment of root canals. The methods of preparing materials in dental offices, the use of broaches and cotton, to say nothing of the indifference to the use of the rubber dam, which has been much too common in past years when contrasted with modern methods of asepsis in the surgical operating room is startling enough to arouse even the most careless to action were he but to consider the consequences. Where could one find a more favorable place to introduce infection into the human body than at the apical foramen of a root canal, into a tissue richly supplied with blood, with the entrance closed by some filling material? Not only should we consider that infection at the apical area is possibly introduced by careless sterilization of instruments, but also by a failure to remove all organic material from the canal and completely fill the opening with a material which will not shrink nor absorb tissue secretion.

STERILIZATION OF INSTRUMENTS AND MATERIAL.

Instruments to be used in pulp operations should be kept in a special case which can be closed tight and subjected to formaldehyde gas. A small cabinet may be placed upon the wall or may rest upon the large cabinet in the operating room convenient to the operating chair. Cutting instruments should be sterilized by boiling. Broach holders should be of metal which will permit of being boiled. Broaches should be cleaned and placed in phenol or lysol solution. Root canal pluggers, picks, and explorers should be boiled. All these instruments may be transferred from the hot water sterilizer to the special formaldehyde sterilized cabinet and kept ready for use. For the sterilization of supplies and materials such as sponges, broaches, napkins, cotton, absorbent canal points, gutta percha plate and canal points there are several compressed steam sterilizers which meet the requirements nicely. The Wilmot Castel Co. of Rochester have a double chambered steam chest which answers the purpose quite well for the sterilization of these supplies. This chest is so constructed that the steam may be confined, causing pressure, and raising the temperature considerably beyond the boiling point of water and after a time the steam may be turned out to allow the materials to dry. These materials may be kept in the steam chest except while in use, the wire basket being removed and placed upon the operating table when wanted or they may be transferred to the formaldehyde cabinet. With every instrument and all material to be used satisfactorily sterilized we have made a good beginning of an aseptic operation.

PREPARING THE FIELD AND GAINING ACCESS.

The consideration of this topic will begin after the pulp has been devitalized or anesthetized. The mouth should be sprayed out and the contacts in the region of operation examined by passing a ligature through to insure the possibility of being able to get the dam to place successfully. Any soft deposits or calculus should be cleaned from the teeth. Should the tooth be broken down by decay beyond the gum margin at any point, a thin copper or german silver band should be fitted around the gum margin and trimmed so as not to interfere with the occlusion and cemented on the tooth to remain while the tooth is under treatment to furnish attachment for the clamp and to insure a dry field of operation. This is of very great importance since there can be no asepsis with saliva seeping around the tooth where the rubber dam does not fit closely. The rubber in place, clean the teeth and dam with alcohol and tincture of iodin. For this purpose alcohol from sixty to seventy percent is best as it has more antiseptic action.

In opening the pulp chamber care must be used to cut away a sufficient amount of the tooth to permit a good view of each canal. In molar teeth it is absolutely necessary to cut well into the buccal and lingual cusps and often it is necessary to cut away a considerable amount of the mesial marginal ridge and wall before exposing to view the openings of the mesial canals. Probably there is no part of the entire technic more essential to a successful root canal operation than the generous exposure of each canal. How often do our radiographs reveal former attempts at filling molar canals through a small opening perhaps to avoid dislodging a filling, which are simply pathetic to look upon? It is better to sacrifice some tooth structure that a safe operation may be completed than to leave an operation that stands eighty chances in a hundred of failure. It may be even necessary to remove half a crown or even all of it to insure success.

TREATMENT OF SMALL CANALS.

It is rarely possible to remove the pulp from a very small canal in one piece. It is often difficult to pass a very small smooth broach to the apex. In such cases one must resort to a chemic treatment. A very small smooth broach, XXX fine, may often be worked well into the canal and allowed to remain while thirty per cent sulphuric acid is carried from a container or glass slab by means of an applicator made of platinum wire bent into a small loop at one end and held in a broach holder. The acid will be worked into the canal by a turning and churning motion with a small broach in the canal. After the acid has been carried into the canal and has remained several minutes it may be neutralized with a saturated solution of sodium bicarbonate. The action between the acid and the sodium bicarbonate is manifested by a rapid bubbling of gas which brings some pulp and debris with it from the canal. It also softens the dentin slightly which allows the broaches to file away the sides of the canal, constantly enlarging it throughout the entire length.

INSTRUMENTS FOR ENLARGING CANALS.

There are several kinds of broaches which are of assistance in this work. First, a smooth broach roughened between two files making a round file of it. Broaches may be obtained with a single barb on one side and others with a single row of barbs on one side, the other surface being perfectly smooth. Barber broaches from fine to the XXX fine are useful to serve as files to cut away the sides of the canal. The twist finger broaches of graded sizes are useful but extreme precaution should be used to prevent their binding and breaking, or, what is almost as bad, from leaving the canal and making false canals in the dentin after which further progress is very difficult, if not impossible. Small drills for the engine are exceedingly dangerous to use and should only be turned by finger power. However, after the canal has been fairly well opened a Gates-Glidden drill may be used to enlarge the pulp chamber opening of the canal to facilitate an easy entrance.

ALKALIES AND ACID TREATMENT.

The work in opening root canals is a slow and tedious process at best. Many times one is confronted with a root which appears so solid that it would seem impossible to penetrate it. The radiographs of many of these roots show a canal farther toward the apex and to pass these cases by with unopened and unfilled roots is very poor service. Dr. G. V. Black has stated that he has never seen the apical foramen closed in any of these cases. To drill into such a root with a bud bur or a Gates-Glidden drill will sometimes lead to the canal but it is a very dangerous practice and one that is only successful occasionally. There is a preparation known as Ward's Sodium and Potassium which was originally suggested by Schreier of Vienna which on account of the nature of the two metals has a great affinity for moisture and organic matter. By passing small particles of these metals into the canal the organic matter is dissolved and calcific matter such as pulp stones, calicified pulp, and some dentin is softened and loosened to permit entrance to the canal. However, the use of this preparation must be attended with the most extreme care as it is very caustic and the least amount passing through the apex will cause a very severe pericementitis. There are antiseptic advantages in this chemic process in addition to the mechanical aid due to the formation of hydroxid of the two metals. This process in addition to opening the main canal will remove shreds of pulp from accessory canals branching from the main canal having separate external openings and will cleanse the broad flat ribbon-like canal so often found in the mesial root of lower molars. After using sodium and potassium the canal should be flooded with water and wiped out with cotton. This should be followed by thirty per cent sulphuric acid to chemically neutralize the alkali after which the sodium bicarbonate solution should be used to neutralize the acid. A few applications of these drugs will be found of great assistance in this work.

Other acids recommended for this work are hydrochloric and nitro-hydrochloric. These acids have the advantage of being more rapid in their action but they are very much more destructive. They are not self-limiting while sulphuric acid is to a considerable extent, forming calcium sulphate and carbon which prevents further penetration of the acid. The sulphuric acid method was introduced by Dr. J. R. Callahan of Cincinnati many years ago. It has stood the test of time and has been found to be a very useful aid in root canal work. Many curved roots with canals almost impossible can be cleaned and thoroughly filled, which could not be opened any other way. Small canals should be enlarged until they can be filled with gutta percha cones and packed with plugging instruments.

FILLING THE CANAL.

When the canals are clean and enlarged sufficiently, a short metal pin should be placed in each canal and bent over a ledge to prevent being pressed through the foramen when sealing the tooth to take a radiograph to prove the work to this point. If the radiograph shows the pins reaching the apex of each canal it is gratifying indeed to both the operator and the patient. If a pin does not reach the apex it may be removed from the tooth and placed upon the radiograph to acertain the actual difference between the end of the pin and the apex after deducting the distortion in the picture. This gives definite information of the distance remaining to be opened and at the same time the direction of inclination and the size of the root. When the root is ready for filling it is open to the apex and enlarged sufficiently to allow broaches and canal points to enter easily. After dehydrating the canal with alcohol and acetone very thoroughly a root canal plugger should be selected which will pass within two milimetres of the apex, but not through the foramen, and a measure taken to show the distance from the end of the plugger to the apex. Gutta percha cones of proper size should be selected from the sterilizer and cut in short pieces from one to three milimetres long. One piece of a suitable diameter should be selected from the cut cones which is slightly longer than necessary to fill the space between the end of the plugger and the apex when the plugger is in position. This should be laid aside ready for use. Now with the canal absolutely free from moisture it should be moistened with eucalyptol and a very minute amount of chlora-percha or eucapercha and then the plugger carrying the selected cut cone taken and the cone pressed to place in the canal clear to the apex, which will be indicated by the mark previously made on the plugger. This method insures a complete filling of the apical portion of the canal without allowing any great amount of excess of chloro-percha to pass beyond the canal. After the first piece of cone has been packed to place other short pieces should be added one at a time in the same manner and packed well into place until the canal is full. In all canals which have very small apical foramina the method suggested by Dr. J. R. Callahan of Cincinnati is especially helpful. Instead of moistening the canal with eucalyptol and chloro-percha it may be flooded with a solution of rosin and chloroform. This solution is pumped to the apex with a smooth broach and cotton dressing taken from the sterilizer, as suggested by Dr. E. S. Best, of Minneapolis. If the canal was dry the solution of rosin in chloroform will coat the canal throughout its entire length with a solution which is absolutely insoluble in water. While the canal is well filled with this solution a full length cone may be selected with pliers, placed into the canal and worked up and down with a churning motion about fifty times until much of the cone has been dissolved in the chloroform and rosin solution. This churning not only makes a chlora-percha solution in the canal but forces the thin solution into small accessory canals and even into the dentinal tubules. At this point the canal plugger carrying the selected piece of gutta percha cone is taken and passed into place in the canal and the cone pressed to the apex through the chlora-percha previously made in the root. When this is packed down to place to the mark on the plugger the operator is assured that the apex must be sealed. Now the remainder of the canal may be filled with short pieces of gutta-percha cones carried on the plugger until the canal is full. Each canal should be filled separately and completed before another is started. When all are filled the tooth should be packed with gutta percha and a radiograph made to check up the work. If the radiograph shows each canal perfectly filled, the pulp chamber should be filled with zinc chlorid cement and the operator may justly feel gratified and the patient may be given assurance that the tooth is in the safest condition that it is possible to place a pulpless tooth.

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ADMINISTRATION OF THE DENTAL LAW IN ILLINOIS.*

BY DR. O. H. SEIFERT, SPRINGFIELD.

In a discussion of the administration of the dental law of Illinois, a word or two in explanation of the financial affairs of the state board may be pertinent. The public as well as the profession manifests considerable interest in state expenditures. They are keenly interested in the problems of taxation and this interest increases from year to year, especially when demands for larger appropriations for practically all the state departments are being made upon the legislature of this state, and for that matter all of the states are continually being importuned to be more liberal in appropriating for such purposes as agricultural development, charity, education, the conservation of life, and public health betterment, which necessarily includes Dental Surgery.

Out of the half million dollars appropriated by the 49th General Assembly of Illinois, for public health betterment, $18,000 was awarded the State Dental Board for its use. Such appropriation, however, is more than offset by the fees collected by the Board and turned into the State Treasury, amounting to approximately $10,000 per annum or $20,000 for the appropriation period of two years. It is apparent, therefore, that sufficient money is provided for the work of the Board as the result of examinations, renewals, fines, etc. Greater publicity perhaps should be given to the fact that the entire work of this board is supported by the profession and is not a tax on the public. Incidentally, Illinois spends proportionately as much as any state in the union for dental work. The Board is endeavoring to increase its efficiency with the funds at its disposal, and with the continued and generous co-operation of the State Dental Society, which by its zeal helped secure the passage of certain amendments to the statutes at the last session of the legislature, much additional good will be attained.

A very desirable amendment was the provision made for an Investigator, whose duty it is to investigate complaints against illegal practitioners and other violators of the dental law.

The lack of information among the profession as to the requirements of the dental law is regrettable. It is no boast, that dentists as a whole measure up to the standard of intellect and moral responsibility that insures good citizenship, but the disclosures of the Investigator show that many men standing high in the profession and in their respective communities, have but slight regard for the law and a passive indifference to suggestions and recommendations of the Board as to safeguarding the practice of dentistry and encouraging the adoption of such measures as will tend to eliminate illegal operators and benefit both the practitioner and patient.

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*Read before the Illinois State Dental Society, May, 1916.

The work of the Investigator is not to oppress or tyranize the profession, but merely to cull out the undesirable. Public appreciation of such work will advance the standing of the profession. The dental law was enacted to aid the public as well as the practitioner and it is a duty of the State Board to effect enforcement of the law in the public's interest, as much as it is to conserve the interests of the profession.

The service of the Investigator as previously stated, was made possible by the generosity of the last General Assembly and his work so far has been limited principally to the City of Chicago. There are approximately 5,000 dentists licensed to practice in this state, the great majority of whom are located in Chicago.

Out of 527 offices visited in that city, 288 instances were located where certificates to practice were not displayed, and while this violation might seem minor, or trivial to many of the profession, it is nevertheless a protection to the public and for that reason this feature of our law should be strictly observed. In addition to the above violations, there were 19 practicing without a license, 15 of whom had never applied to the Board. Five of these alleged dentists voluntarily discontinued operation, but are under the surveillance of the Board. Of the cases taken into court, several convictions have been obtained and fines amounting to several hundred dollars have been collected. There are still pending in the courts of Cook county, 8 cases for practicing without a license and 2 for having unlicensed men employed. Four of these cases are old offenders but evidence is on hand which will secure convictions. More publicity should also be given this feature of the law, but in so far as it is understood, it is thoroughly appreciated, and the work of Dr. West, who is the Investigator referred to, should be encouraged; he deserves much commendation for his efforts so far.

Similar work is being conducted throughout the state by members of the Board and the office of the Secretary. Violations have been located at East St. Louis, Litchfield, Forreston, Greenfield, Mattoon, Decatur, Peoria, Hume, Raymond, and a few other towns down state, and will be disposed of in compliance with the provisions of the law and to the best interests of the profession.

Another change which the praiseworthy co-operation of the dental society made possible, has to do with examinations: preliminary educational requirements which enter so largely into this matter have always proven of much concern to the board and possibly with some injustice to the applicant. There are many who are lax in some of the fundamental requisites. Formerly the necessary examination was conducated by a deputy examiner appointed by the Superintendent of Public Instruction; now we have a commission of three members appointed by that official to take care of this matter, and the qualifications of each applicant are diligently considered.

Board examination work has been greatly improved, by providing that practically the full board conduct the theoretical and practical examinations. Care is also taken to preserve examination papers.

Reciprocal arrangements have been somewhat modified, formerly practitioners from other states in which they were duly licensed to practice and had five years' experience could practice without an examination in this state, such privileges are now extended only to applicants that come from states that have reciprocal arrangements with Illinois and after passing the practical examination.

The Constitution of the United States limits the control of the Federal Government to certain specific functions and also requires that the states shall exercise certain duties, both of which provisions are for the welfare of the citizen of both state and nation. Constitutional restrictions preclude the possibility of federal uniform legislation so far as the practice of dentistry is concerned. The states in their development enact only such measures as are necessary for the welfare of their own people and the economic condition determines to a large extent just what enactments are necessary. In a frontier state in days gone by railroad legislation or the control of public utilities was not the concern of such a locality as it is today, and so with the science of dental surgery in communities where education is of a high standard and where the care of the teeth is considered a necessity, laws are enacted to meet the situation and as these conditions vary in the different states, we have great variations or differences in the laws. Statutory requirements concerning preliminary education are not required in thirty of the different states, graduation from a three-year high school course is required in California and Nevada; four years in Michigan, Nebraska, New Jersey, North Dakota, New York, Wisconsin and Illinois; Indiana, Iowa, Kansas, New Hampshire, Utah, under rules prescribed by the Board. Pennsylvania requires competent education and a few states high school education or the equivalent.

Professional training, viz., graduation from a reputable school recognized by the National Association of Dental Faculties, is required in about eight states, from a reputable dental school, or certificate from another state, four to five years apprenticeship or from three to five years practice is required in many of the states. Arkansas, Massachusetts, Oklahoma, Rhode Island, Texas and West Virginia have no requirements. Examination, or its equivalent and registration is now practically demanded in all states. The standards of registering schools differ in the several states just as the universities decline to accept credentials of certain colleges, and State Boards of some states distinguish between registered and accredited schools. These legal and educational differences prevent uniformity and while the states whose requirements are severe wish to protect their citizenship the same demands are not made by other states who may be just as zealous of public welfare but have not reached that stage of development where such drastic measures are necessary.

This complex situation in the dental laws is due to economic conditions varying in the different states. Practitioners as a general thing should find no difficulty in prosecuting the science of dental surgery in any particular state. Certainly those who can meet the requirements in the most exacting states can practice anywhere, but a capable dentist in a state that is lax or does not require high standards might be considered a low grade man in a first class state, so that a reliable practitioner is more or less the product of the state in which he practices.

In the matter of extending the powers of the Board, some thought should be given to the question of state supervision over all dental schools and to encourage through the state's educational departments a closer contact with the dental student, thus minimizing the arduous duties connected with examinations and insuring a higher grade of applicants. In other words, the schooling or educational preparation should be largely the work of the educational system of the state; after licenses to practice have been issued, further influence of the educational system should be discontinued and the matter of safeguarding the public welfare should become solely the affair of the board. The State's educational system should be utilized to the fullest extent in the training of the student, but after they are permitted to practice, pedagogic control or influence should be separated and the administration and enforcement of the law remain wholly the concern of the dental board.

The less law governing the practice of dentistry, the more liberty for the profession, but when ethics are violated the necessity for legal restrictions becomes apparent, hence the profession can do much of its own accord to eliminate the obstacles that are usually discussed before such bodies as this and the laxity in "dental things" that we so much regret will diminish with the increased interest which is manifested by such gatherings as we have today.

With improved methods of education for the student, which is in itself a guarantee of success, with the constant striving for extended research, the next generation will be insured healthy teeth and clean mouths which will raise the standards of living and an appreciative public will have greater respect for the profession, the regulatory features of the law of today will become unnecessary and restrictions diminish. Genuine co-operation will result in the attainment of these high standards.

PRESIDENT'S ADDRESS.*

BY DR. O. G. KRAUSE, MILWAUKEE, WIS.

Members of the Wisconsin State Dental Society, Ladies and Gentlemen:

As your presiding officer it affords me much pleasure to bid you welcome to this, the 46th Annual Meeting of this organization. Your coming here from every section of the state to take your post-graduate course, is a compliment to your officers and a credit to the profession which you so ably represent. You not only come to improve yourselves but to become better acquainted with each other, and take a much needed rest.

I take this opportunity of expressing my sincere thanks to you for the honor you have conferred upon me by electing me to the highest office within your gift. This honor I prize very highly and I will cherish this event as long as I live.

I also wish to express my gratitude for the confidence you placed in me by electing me as your humble secretary for five consecutive years. During this period I had the pleasure of watching this organization grow from a membership of two hundred to a total of about seven hundred. This substantial and gratifying increase in membership can largely be attributed to the reorganization of this society in 1908—the plans of which you are all familiar with. A splendid and remarkable increase it has been when you stop to realize that it took about forty years to enroll a membership of two hundred.

Remarkable as this growth has been, there are still about five hundred dentists who are eligible to membership who are not enrolled. These must be urged to join. The question confronts us how can this be accomplished? This problem is not a new one. It confronts us every year and a good deal of honest effort is expended by us in attempts to reach the dentists outside of this Society. Shall we continue merely to urge them to join by means of argumentative circulars or through the medium of our excellent journal, or shall we reach them by personal solicitation? The latter method, I believe, is undoubtedly the most effective. These two means of increasing the membership are, however, not the only ones that we may employ. During the years when I was secretary I frequently received letters from non-member dentists stating that they did not think it necessary to join this Society because they could attend open dental meetings in nearby States and within this State without membership. It is difficult to comprehend the shortsighted, and I may say selfish, view-point of these men. It is hard to see how they can justify themselves. It is a situation which we must meet, however. In order to bring these men into the fold and aid them in coming to a realization of their negligence I respectfully urge this Society to take steps toward requesting these other dental organizations to restrict their admission in a similar manner as has been the practice in this Society. I am sure these organizations will be glad to co-operate with us. When this is accomplished those wishing to attend any dental meeting will be required to possess a State Society membership, a certificate of ethicacy which will gain admittance to any large dental meeting in the world.

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*Read before the Wisconsin State Dental Society, July, 1916.

SECRETARIES.

The success of any organization of this kind depends largely upon a competent secretary. Without that help no organization can progress. We have only to turn our eyes to that able and hustling secretary, Dr. Otto U. King of the National Dental Association. Under his guidance the National Dental Association has developed by leaps and bounds. We want our Society to continue to grow and develop and I believe this consummation can be enhanced by the retention of the present secretary. He is just getting acquainted with his work and I believe it would be a loss to the Society, should he not be retained in his present position. We should also have competent and hard working secretaries in our component societies. I desire to suggest that an organization of local secretaries be organized with the State secretary as their chairman. I am sure much good can result from such an organization within our Society.

ELECTION OF OFFICERS.

The remarks of Homer C. Brown, President of the National Dental Society, in 1914, upon the election of officers, impressed me greatly when he said, "Do not select men because of their prominence in the profession or popularity in their own locality, or because of their geographical residence, but because of their ability and what they have done for your society and what pep they possess to keep this organization keyed up to its highest notch."

EISEN MEMORIAL RESOLUTION.

The Almighty has seen fit to remove from our midst, one of our beloved members and first editor of our journal. His death is a great loss to this Society and to the profession. May I ask that a committee be appointed and a suitable set of resolutions be drawn and spread upon the minutes of this Society, and a copy be sent to his widow.

G. V. BLACK MEMORIAL.

Since our last meeting the dental profession was shocked to hear of the death of Dr. G. V. Black. Perhaps no individual during our day contributed more to dental science than he. In appreciation of Dr. Black's services to the profession and to mankind, I believe it would be a privilege that we be allowed to follow the lead of Illinois to contribute a suitable amount toward the erection of a monument to memorialize his name.

NATIONAL RELIEF FUND.

The National Dental Association has, for some time, started what is known as a "Relief Fund" for indigent members of the profession. I understand there has been raised about twelve thousand dollars this far. Fifty thousand is desired before any of this amount is to be used. In order to raise this amount Christmas Seals will be sent each one of us, asking us to remit one dollar for same. I trust each and every one of us will make a prompt remittance for this worthy cause.

RESEARCH INSTITUTE.

It is indeed gratifying to learn that a research institute has been established by the National Dental Association at Cleveland, Ohio. An institute of this kind has been long sought for by the dental profession. How this has been accomplished, I do not wish to go into detail as this has been explained in our National Dental

Journal. To carry on this splendid work a great deal of money is necessary. Wisconsin has contributed a small amount. Other societies have contributed a considerable more even going so far as to change their by-laws and add one dollar for the National Research fund. What we shall do in this State I shall leave to you. Personally I do not approve of forcing this upon our members, but would like some other effective way adopted. We cannot afford to fail to do our duty toward this noble work.

It has been stated on good authority that the Dental educational institution in our own State is considering the installation of a research department which is to be conducted in the interests of the profession in Wisconsin. Such a move should have our hearty support.

FIFTIETH ANNIVERSARY.

Our fiftieth anniversary, our golden jubilee, is fast approaching. Undoubtedly every one of us wishes that this event be celebrated in a befitting manner. It is of the utmost importance to the success of this great occasion that steps leading in this direction be started at once. Let us make this event a fitting climax of fifty years of this Society's existence. The city of Milwaukee possesses an Auditorium which can house the largest dental meeting in the world and would be an ideal place to conduct this meeting. Perhaps it might be a good idea to invite our neighboring state societies —Illinois and Minnesota to assist us in this celebration thus making it sort of a tri-state meeting, or invite the National Dental Association to hold their meeting in Milwaukee at the same time as ours.

DENTAL EDUCATION.

Great strides have been made in Dental Educational institutions during the past three years. It now seems assured that all Colleges will adopt a four year course beginning with 1917. Marquette Dental School, the only Dental School in Wisconsin, offers an optional four year course this year and will require this beginning with October, 1917. This has been made necessary by the rapid strides within the profession. Some of the most progressive of the Schools are offering optional four year courses beginning this fall.

The four year course will undoubtedly develop young dentists who will be more skillful in the operative and prosthetic field and better informed along scientific lines than the graduate of three year course. The addition of the fourth year puts Dentistry on a par with any of the learned professions. The Dental Profession should welcome the change because it must be remembered that in the long run the public will not give the Dental Profession recognition that it is entitled to unless we Dentists have a high opinion of it ourselves.

DENTAL LEGISLATION.

During the winter and spring of 1915 the legislature passed a Dental law that, while it is not ideal by any means, was undoubtedly a big step in advance. The men who gave their time and efforts toward passing this bill are well known to you and this Association owes them a great deal of thanks. It was hard sledding, however, and for a time it seemed as if the bill would be defeated, in fact the Assembly did kill the bill at least once, to say nothing of other rough handling in the committees. A small group of dentists not members of this Association, backed by some of the Milwaukee newspapers who have advertising space for sale, almost defeated the bill. Why? Because they were well organized. It seems to me that this Association shall immediately take steps to make it possible in some way to throw our entire strength into any future legislative battle. We must organize for the coming winter. We must assert our strength. I earnestly recommend that a strong active group of peptomists shall be put on the legislative committee. But that is not enough. Each one of us, privates in the ranks, must be ready and willing to follow orders. Unless we organize and stand by the guns loyally we cannot make our influence felt with the members of the legislature. Our laxity in this respect is to me one of the weakest points in this organization and one of our most serious shortcomings.

THE DENTAL BULLETIN JOURNAL.

I believe it will be a wise policy to continue the publication of the Bulletin. Dental organization is just in its infancy. A publication of this kind where every member of the profession may be in touch with what is going on in the Dental world is necessary.

It will be a great help for a campaign for new members and a plea for Dental preparedness may be instituted. This Journal should be the mouth-piece of this Society, that the views of this organization may be expressed in a fearless and independent manner. I believe that has been the policy of the present Editor. He should receive our cordial support and encouraged to continue the good work he has just begun. I believe two issues per year would be sufficient and within the limit of our present finances.

In conclusion I trust that each and every one of us will be greatly benefited by the program arranged for you. We must all remember that we shall profit by a meeting of this kind in exact proportion to the amount of energy that we put into it.

Get acquainted with every one here. If there is no one to introduce you, just introduce yourself and don't leave until you have examined every clinic thoroughly. Again allow me to thank you for the honor you have conferred upon me. I also wish to express my thanks for the hearty co-operation accorded me by the officers and other members of this Society. As I step back into the ranks as a private you will find me working just as hard for the success of this organization as I tried to do as an officer.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-SECOND ANNUAL MEETING, HELD AT SPRINGFIELD, MAY 9-12, 1916.

DISCUSSION OF DR. CONZETT'S PAPER "THE TREND OF OPERATIVE DENTISTRY."

Dr. Le Roy Snowden, Peoria:

I don't know who had the most nerve, Dr. Cruise, in asking me to discuss this paper, or myself, in accepting the invitation. I am sorry I did not have more time to devote to it, as Dr. Conzett has done in his able manner. I wish also to pay a tribute to the memory of the late Dr. Black. I remember Dr. Black best when I first knew him in my junior year in the Northwstern University of '94-95, when he gave to the Junior Class the result of his scientific work before he published it. Dr. Black was ahead of the rest of us and we will be following him to the end of our labors. I find comfort in reading Dr. Conzett's paper, as I have thought of a great many of these things he told us about but never said anything about them. Tooth conformity bringing harmony and alignment, the art to the front, instead of purely mechanical operations, a nicely finished gold filling in itself is not what we wish alone to accomplish, and its usefulness is marred, in fact, it is harmful, it not artistically filled as nature had it, preserving the arch and relation to the others. Exact tooth reproduction will do its share to prevent pyorrhea and abscess. I have not fully made up my mind to cut into healthy tooth structure to restore contact unless very badly needed. In speaking of the gold inlay, I find the greatest danger of failure is at the gingival margin. If you wish to find out how well your inlay fits the bottom of the cavity, though seemingly faultless at all other points, place a piece of ordinary warm base plate wax across the cervical portion of the filling and drive it into place, remove and you will be surprised at the amount of space in most cases. I usually remedy that condition by packing gold foil over the margin before cementing the filling into place. Work rapidly and to the point and if you are not in the habit of giving your patients short sittings, try it and see the effect. Secure the confidence of your patient. I take it you have it to a limited degree or they would never have come to you in the first place, and assure them always of your best service. When I was a boy, I was employed at odd times by an old man who hauled lumber, and he taught me never to lay a board down until I got it where I wanted it. I remember that almost daily, using the instrument in hand until I have done all I can see to do with that one instrument before laying it aside. I think you will find most people will forget the number of times they come to see you if you give them short sittings and keep in mind at all times satisfactory results. As Dr. Conzett has told you, we are hearing a great deal about infections from faulty root canal filling. I maintain we are charged by the general practitioner with too many sins of which we are not guilty. I do believe a great many teeth are infected beyond the end of the canal by forcing infection through with blasts of compressed air, and at this time I wish to refer back to the way in which Dr. Black in his lectures before my Junior Class demonstrated to us the dangers of carrying saliva through the apex with the broach. He was making some cultures in a test tube and one of these tubes was filled with gelatin. He placed a sterilized platinum wire on the inside of the lip of one of the students and forced it up through the gelatin, stopped the tube and set it away. And in course of a little while a path of bacteria marked the course of the broach. He impressed that upon us with this remark, which I have remembered to this day: "Now boys, never carry saliva into the root canal." I was very much pleased when the essayist near the end of his paper laid some stress upon the esthetics of dentistry. This has been one of the hard things to do. I take it that Dr. Conzett wished to lay especial stress upon the trend of operative dentistry in the direction of tooth conformity and alignment, speed and comfort, and esthetics.

Dr. Arthur D. Black, Chicago:

This society has only occasionally deviated from its rather fixed policy by inviting a man of prominence from outside the confines of our state to present a paper before us. It is, therefore, a mark of the high regard in which we hold Dr. Conzett that he was chosen to tell us something of his work and thought in this particular field. The paper which he has read is full of suggestions for improvements in practice and should guide us toward higher ambitions and more perfect service.

This paper is difficult to discuss, for the reason that it covers such a wide field. I will confine my remarks to a few of the matters which have been presented by Dr. Conzett, rather than to try and review the entire paper. There are many things in the paper with which we all agree; these have been well stated by Dr. Conzett, and I need not repeat them. Therefore I will take up a few things with which I may not fully agree.

Doctor Conzett spoke of the larger perspective in operative procedures. I presume it would be rather difficult for us to decide today where "operative dentistry" begins or ends. You could not do so from the published curricula of the various schools, because different schools include different things under the study of operative dentistry. It would seem from Dr. Conzett's paper that he has included all filling operations, pulp and root canal treatment and the treatment of the investing tissues of the teeth. Much of dental pathology and therapeutics is thus included. It is well that these are included, since, in our operative procedures, even in the narrowest consideration which we can give to them, we are in immediate contact with these two groups of conditions, which constitute the bulk of the focal infections within the mouth. I want to say a word about this phase of the subject.

A few years ago I read a paper on alveolar abscess, and the man who opened the discussion of my paper, which I confined strictly to alveolar abscesses, talked entirely on methods of oral prophylaxis, and did not refer to alveolar abscess at all, except to say that if proper methods of oral prophylaxis were carried out the teeth would not decay and there would be no alveolar abscesses. I do not want to leave the same impression, in mentioning the subject of focal infections under the head of operative dentistry, but there is a closer relation than we possibly realize.

We all appreciate today the importance of pulp conservation, and pulp conservation is certainly included in operative dentistry. We should all exercise everey means to conserve the pulps of teeth. We should be a little more careful in our cavity preparation to avoid those positions in the dentin which are close to the horns of the pulp, what have been termed the rescessional lines of the pulpal horns; those lines along which the horns of the pulp gradually recede as the dentin is built. In all cavity preparations we should avoid these lines, because it is not only the exposure of the pulp, but the danger of its death from near approach, which should be guarded against.

We are quite as closely connected in our operative procedures with the other group of infections which start as gingivitis, to which Dr. Conzett has referred. I will say but little regarding these, except to discuss what Dr. Conzett says regarding the restoration of tooth form. I agree quite fully that the mesio-distal width of the tooth should be restored, but not with what he said about occlusal surfaces. He said that we should reproduce the pits and fissures of these surfaces. Pits and fissures are defects in the surface of a tooth, and we are going too far when we attempt to reproduce the defects. Normally formed teeth have fossæ and grooves where the various lobes of enamel join together, and these grooves should be restored, but not the defective pits and fissures. Possibly this was only a slip in nomenclature. In the carving of wax models of occlusal surfaces for inlays the lines of the grooves have, however, been too frequently made deeper than they should be. They should not catch or hold food, but should be of such smooth contour that they will be self-cleansing, as is a normal occlusal surface.

Dr. Conzett spoke of changing the form of the occlusal surface so that food would be directed away from the interproximal space instead of into this space. If he meant that, I must take exception, because above all things for the preservation of proximal surfaces and the health of the septal tissues do we want food to go into the embrasures in order to scour and keep them clean. Do not misunderstand my statement. We need to have a contact so tight that food will not pass it in chewing. We need to have it so round and the surfaces of the two teeth so convex, that we will have well formed embrasures on the buccal and lingual sides of the contact, and then there should be a considerable surface from the marginal ridges of the two teeth inclined toward the point of contact. This will result in the natural cleaning of the exposed portions of the proximal surface of the tooth in mastication. There has been too much tendency to raise the contact to the plane of the occlusal surface. When this is done, food which should go through the embrasures is all skidded distally and mesially away from the interproximal spaces, and thus the cleansing of the embrasures by mastication is lost. In all of this we should make more careful studies of normal tooth forms.

Dr. Conzett mentioned the danger of injuring the "delicate" septal tissue. While I fully agree that injury of this tissue should be avoided, I call attention to the fact that it is hardly to be considered a delicate tissue. In fact it will maintain itself against much punishment. It has a very full blood and nerve supply and recuperates quickly. Yet we must recognize the fact that even this tissue will gradually break down under continued irritation, such as results from an open contact. It is, however, often several years before serious injury results. Therefore most of us have the opportunity to find these inflammations, and correct the cause before serious injury comes, and we should never miss an opportunity to do so.

I want to emphasize as strongly as I can what Dr. Conzett has said about asepsis in pulp treatment. I think he might have made it even a little stronger than he did. Dr. Buckley referred to the injunction that from the time we undertake the treatment of the pulp of a tooth until the root is finally filled, saliva should never be allowed to enter the pulp chamber or root canal. I make absolutely no exception to that. We should always use the rubber dam to wall off the field and have the best of asepsis.

I cannot agree with the statement of the essayist that we may expect that the apical foramina of pulpless teeth will be closed by the building in of cementum. While this may seem to happen in a limited number of cases, definite evidence should be presented before it can be considered as a basis for practice. We see a few teeth in which it is difficult to find an opening through the end of the root. I think the majority of these cases, however, are teeth which show excementosis, the cementum being built in unusual amount on the outside as well as on the inside of the end of the root.

I would like to dismiss this phase of the question with the suggestion that we, today, know mighty little about what is being accomplished in our root canal procedures. For example, we do not know whether most abscesses result from what we would call small canals or large canals. We ought to know, because the technique for the two groups is different. What percentage of blind abscesses are cases in which the pulp was dead before the root canal filling was undertaken, and what percentage occur subsequent to the removal of vital pulps? We do not know, because no one has presented definite evidence along this line. What effect has the various medicaments that we have used in root canals in the tissues beyond the apex of the root? What percentage of chronic abscesses has been caused by medicaments? We do not know.

I mention these facts for this reason and for none other—to call the attention of every one of you to the fact that the profession is not going to be able to know these things which are very important for us to know, until a good many men keep records of cases so they can know the results. Unless a record is kept of the condition of each pulp when treatment is undertaken, and of every step in the treatment of the case, which may be referred to years afterwards and compared with radiographs, it will not be possible to know results in relation to treatment. I wish to make a plea to the members of this society that their study of these several conditions be more serious, that your records be such that you can tell what you are accomplishing. It will take years to find out. Each man will have to work these problems out for himself to a large extent, and I know of no problem before the dental profession today which presents a nicer field for a little private scientific research, nor one which is of more importance. If there could be gathered together here at this meeting reports from two hundred men, each of whom had records of two hundred root canal fillings, with the data that I have suggested, we would have enough evidence to lay down several definite rules for pulp canal treatment. But we do not have this evidence, because so few men have kept good records.

Dr. Conzett spoke of gold fillings and gold inlays, porcelain inlays, and silicious cements. I do not know that I can add anything to what he has said on these things. I might say that I have found very few proximal fillings made with silicious cements which maintained good contacts. After they have been in the mouth for some time a silk ligature carried through the contact will be more or less frayed; it will not come through as nice and smooth as it would if a porcelain inlay or a well polished metal filling had been placed. I am inclined to think that the easier technique of the fillings with silicious cement has led some of us farther astray from the use of porcelain inlays than we should be today.

Dr. Conzett did not mention amalgam fillings. The more I have watched the results of my own operations, in which I have had but one rule regarding the technique, and that was to take all of the time that was necessary and make the best fillings I could, the more am I convinced that we have in high grade amalgam a filling material which is very much better than we are giving it credit for today. I am thoroughly convinced that many of the operations we are doing today with gold inlays would be very much better done with amalgam fillings properly made. (Applause.) Because of the fact that we can get a much larger fee for a gold inlay, we have put in more inlays and less amalgam fillings than we should.

I have never been able to understand the attitude of the dental profession toward the use of amalgam. It is not difficult for the patient to recognize the technique of the proper method in putting in the amalgam as compared with the other. You must either let your price drop down to what has been the common charge for amalgam fillings, which means that you will do the filling as the other fellow does—throw it in any old way; or else you will put on the rubber dam, use high grade amalgam, use the matrix and separator, and do it as it ought to be done, and then charge a proper fee for that operation, and you can get it. (Applause.)

I have kept a record of every amalgam filling I have put in, and in checking over my records of these as compared with gold fillings and gold inlay operations, I have nothing to be ashamed of in the record of amalgam fillings. We have had before the dental profession for twenty years amalgams that are absolutely dependable so far as shrinkage and expansion is concerned, and yet there is only a small percentage of the profession using alloys of that kind, because the unreliable alloys cost a little less per ounce. Why not buy amalgam that is right and use it in the way you know it ought to be used? Why not make fillings of this material that are many times better than a good many of the gold inlays put in today, and do better service and get paid for it, as I am sure you can if you will make up your mind to do so.

If I were going to make a last suggestion as to what the trend should be for the future of operative dentistry, it would be much along the same line as I have taken on amalgam, that most of the failures of operative dentistry today are due to a lack of carrying out the most careful technique, of putting into each operation the best that we can put into it. We get busy and we slip a little—we do not quite finish the filling here, we do not put on the separator and finish it the way we know it ought to be. It is in the little things, it is in keeping ourselves right up to the maximum limit of efficiency in handling the smaller details. I believe that in the matter of pulp conservation, in all of our dental procedures, we will in the long run do much to cut short the present multitude of focal infections, by the development, by each one for himself, of a more perfect technique and a higher efficiency in everything we undertake. (Applause.)

Dr. J. F. F. Waltz (Decatur):

Mr. President, Ladies and Gentlemen: I was glad to hear Dr. Black pay such a high tribute to amalgam. It has seemed to me more and more as I see the results of good amalgam work that, everything considered, perhaps it is one of the most valuable services that we render. When one considers the number of sittings and the nervous tension for both the patient and operator in making a large gold restoration by either foil or inlay, it seems to me perfectly foolish many times to make these posterior restorations with gold when they can be done so much more easily in amalgam, and I fully believe that if the work is done in a conscientious manner that the question of collecting the fee will adjust itself satisfactorily to both parties in the procedure. The long-drawn-out operation in gold foil of some time ago, and the perhaps just as long-drawn-out operation today with the gold inlay, while not under such tension to both parties as with the foil, is not to be compared with the operation with amalgam, and it does seem that there should be some great advantage, some very apparent advantage in the use of the more difficult material to make us so generally use that material to the exclusion of amalgam.

Some fifteen years ago in eating some salted peanuts I bit down upon a bit of stone in one of them, and crushed the mesio-buccal cusp of the upper first molar. That tooth had in it a mesio-occlusal filling made of foil. I thought I should like to be subjected to the worst possible conditions so that I might a little more properly appreciate the patient's standpoint, and insisted that the separation be made immediately and the operation concluded with one sitting. I very well remember, gentlemen, and I do not think I shall ever forget the ordeal. We began about nine, and it was a little after noon when I was turned out a finished product. I believe it would be absolutely foolish, it would be contrary to the best interests of most patients to subject them to a similar ordeal. I have often thought that, everything considered, if the operator would put himself in the patient's position there would be far more posterior restorations made with amalgam, and made in the way which the dentist, if he were the patient, would want the operation done in his own mouth.

DR. J. M. BARCUS (Carlinville):

I get up with some fear and trembling, because I know the danger of taking the opposite attitude to that of another speaker like Doctor Arthur Black, for he knows what he is talking about; but, gentlemen, I do too in this case. I do not see the use of putting on the rubber dam to insure dryness while putting in an amalgam filling—in most cases. If there is anything that worries me as a patient it is the rubber dam. I submit to it gracefully as I submit to all disagreeable things when I have to, but not a minute longer. The matter of dryness I appreciate as much as anybody else, but dryness can be secured with napkins and the saliva ejector, in the upper teeth with little trouble. In the lowers it requires more frequent changes of napkins, which means a little more work, but less trouble and worry to patient and operator than the use of the rubber dam would cause.

DR. F. H. BOWMAN (Springfield):

As I am the man that Doctor Conzett referred to when he said how much comfort I had received from the occlusal surface being restored, I feel that it would not be just, as Doctor Conzett is not here to close the discussion, that I should not refer to it. In my mouth the chicken he referred to found this condition—it found a beautifully polished inclined plane and it started down that inclined plane and came with such force against the contact point, which was firm enough on ordinary occasions but which could not stand this force and so the chicken fell through, much to my discomfort. Now what Doctor Conzett did was to make a nice little valley along this beautifully polished surface and rounded the corners of the filling, diverting the food buccally and lingually instead of forcing it between the contact points. Now that was some time ago, and I have had a great deal of comfort. Instead of hunting a toothpick after every meal, I do not need anything at all any more than with my other teeth.

The restoration of the occlusal surface, not the defects but the normal form of the occlusal surface, is very important.

DR. EDMUND NOYES (Chicago):

There is one small thing, perhaps not very important, but I am going to speak of it. I do not wish to mitigate in the slightest degree the importance of what has been said about the restoration of the occlusal surface and the treatment of the proximal surface so as to insure the cleansing by the free movement of food through the embrasures buccally and lingually instead of into the proximal space. But we make a great many operations upon teeth which have been seriously weakened by decay. In some of these the cusps are prominent and the interdigitation of the opposing cusp is deep, and the weakened tooth—you have all seen it—will sometimes break under the grinding force of mastication. Perhaps it is simply soft bread that does it. They say teeth break oftener on soft bread than eating hard things or chewing meat, and I think it is true. In some of these cases I think it is worth while to sacrifice a portion of the masticating efficiency for the sake of diminishing the risk of breakage. You may do so partly by shortening the cusps, partly by neglecting quite so perfectly to restore the depth of the sulci, and so greatly diminish the probability that your tooth will come back by-and-by with the lingual or buccal side split off.

I will not attempt to discuss the paper very much. He spoke of the ease with which silicious cements may be made and finished. I want to tell you, gentlemen, that finishing these silicious cements is not easy. It is one of the most careful and particular operations that we ever try to do, and unless the very greatest care and closest observation is used in the finishing you will not get a perfect finish. If you do finish them perfectly I have not one experience of their showing any less smoothness afterwards to the passage of the silk than does a gold filling.

DISCUSSION OF DR. PROTHERO'S PAPER "THE PRESENT TREND OF CROWN AND BRIDGE WORK."

Dr. J. D. White (St. Louis):

Mr. President, Doctor Prothero, Gentlemen and Ladies of the Illinois Dental Society: This talk of mine will probably be rather rambling, and while the subject is one which we might take a great deal of time to discuss and has a great many points which we might emphasize, I will ask you first to forget about the modern trend of bridge work and go back twenty, twenty-five or thirty years ago and recall the class of bridge work that was being inserted at that time—the class of abutments used and methods of attachment, the kind of dummy teeth that were used, the methods of cementation, etc., and I will ask you if after this period of years there has been an appreciable difference in the methods of practice? I am also going to ask you to go into the laboratories of Chicago, and St. Louis, and various other cities, with me while the morning mail is being opened, and to examine the various cases that are coming in there from the rank and file of the dental profession, and the kind of bridges that these laboratory men, many of them without training at all, are asked to carry to a finish, returning them on the four-fifteen in the afternoon so that they may be inserted the next morning. I mention this in passing to emphasize a few points. One is that there has not been very much progress in crown and bridge work among the rank and file of dentists, and while Dr. Prothero says that the student body of today is taught crown and bridge work, I want to go on record as stating right here and now that he is not taught crown and bridge work, and not until a fourth year is added to the present curriculum of our schools, and the compelling of the student to carry on under the supervision of well educated and trained crown and bridge men the construction of all kinds of cases, these men assisting in the diagnosis of cases as they present, and having him work as interne in the infirmary for a period of months—not until then will he be able to go out and diagnose cases as he should, and that is why he gets cold feet and turns to the laboratory. I have watched a great many men go out of school and have known that they could make a bright gold crown on a plaster model, but immediately they go out into practice I meet them going to the laboratory, or I happen to be around and I see in the dental depot a case on the table and the tooth clerk is selecting some teeth, and this model is marked Dr. So-and-So, in such-and-such a community, and here are the abutment teeth not finished as he was taught to make them, and the Lord only knows how the bridge will fit when it is finished by the laboratory man.

I saw in a trade journal not long ago an advertisement coming from New York which called attention to a great field for laboratory men—thousands in it, a demand for these men among the dental profession of the United States, and it is a demand that must be filled and will be filled, not by graduates of dental schools, but by men who do not have an education and study this particular type of work. Now even they see that we are a little bit delinquent in our duty. I do not believe that any piece of crown or bridge work is worth doing at all unles you can carry it to completion yourself. (Applause.) I saw some beautiful clinics this morning, and I saw two crown and bridge removals and bridge and plate clinics—and the work was excellent in the extreme, a great many practical points there, but yet it does not meet that particular point that the average rank and file of the dental profession must have. We must have a system of bridge work that will be standardized, just the same as G. V. Black's cavity preparation, and one that we can arrive at in a way that every dentist knows that when he carries a piece of bridge work through in a certain way he can say "I have done the best I can." I would like to see a commission, or better still, I would rather see the dental profession go down in their pockets and pay the Research Commission to hire skilled technicians, consulting with the men who are recognized authorities in this particular class of work, and probably agreeing in time as to the best method that should be employed in this work.

I recognize the fact that there has been too much bridge work done in the past, and it is not to be condemned as bridge work, but for its indiscriminate use. It has its special indications—the place it should be inserted and the kind of bridge that should be inserted. I do not believe that every man can construct bridge work as Dr. Knoche showed this morning. I do not believe that all of our skilled technicians can do this work; but I do believe that we can acquire that skill of technique so that the roots to be used for abutments can be properly prepared, on just as scientific lines as the Black cavity preparation.

Now I want to emphasize another point. Some mention was made about keeping canals dry, and I want to say this, that while you are keeping canals dry and doing your canal work preparatory to bridge abutments, it is possible to use the rubber dam. What filling are you using that will not be dislodged in the subsequent reaming. I believe a great many focal infections occur with careless reaming out of the canal or infecting the canal filling. I believe that most of the reinfections at the apex of the teeth that carry crowns are caused by this. I believe the majority of men can successfully open and clean out a root, and fill the canal at the apex, if they are careful.

There is a new term, "anchor dentures," and I like it. I believe the solution will be a system of anchor dentures with scientific attachments in preference to removable bridge work. In the question of the devitalization of these teeth, I believe we can learn a whole lot by listening to the talks of these men that are teaching canal treatment and canal technique, and if we are careful we can put teeth in shape so that they will be in perfect condition when we start to bridge them.

I have a few criticisms to make upon the selection of abutments and I do believe that in certain cases where we are using a bar across, that instead of that bar being attached to one it should be attached to two teeth. I believe the torsion soon loosens that one tooth. It is the strength in the cementation of the attachment in removable bridge work that we do not pay much attention to. We think if we cement a cap on there it will stay because it is cemented. We are talking about removable bridges, and then the question of split bone comes up. I saw tubes inserted into canals this morning, and then I saw the reverse in some other clinic, where the split pin was attached to the bar, and I believe this is preferable because I do not believe in hanging an anchor denture on tubes inserted in canals. I have known patients to remove that denture long enough to get a bit of something in there, and in attempting to force the denture home it put it out of line so it could not be used again.

I want to take up the question of dowels in bridge work. When we think of fixed bridge work we usually think of short bridges, those carrying one or two teeth. We should have a system of caps and dowels that would give us the greatest amount of strength and yet present a surface to the free margin of the gum that will conform to the shape and anatomy of that tooth previous to the cleaving of the enamel. This condition is illustrated in Dr. Goslee's book, the contour presenting the same surface that existed before the removal of the enamel (and I take it you all remove the enamel in the preparation of these abutments). In the posterior crowns I believe we must come over to the shoulder method or methods like Dr. Orton's. He has figured out what seems to me the logical technique where you are to use accurate fitting abutment crowns on posterior teeth in fixed bridge work. I do not believe any man can fit an ordinary band as the technique has been carried out in the past—can fit so tightly and accurately but what the moisture of the mouth will penetrate to a certain point. But with Dr. Orton's technique of rounding out that shoulder and driving up a gold band and building it up with wax and casting on it, we will make an accurate fitting crown. If we will adopt methods that preserve the contour, and look after the contact points and these occlusal surfaces that we have been hearing about this afternoon we can depend on a higher degree of permanency in our fixed bridge work than ever before. Also in the selection of dummy teeth, I believe teeth should be used that will throw the solder nearer the occlusal planes instead of near the root.

Dr. Black has said the gum septum is the toughtest tissue in the mouth, and I grant that. If it was not there would be no value in high-grade work, for we would have no gum septum left. And we must use the right kind of teeth. I want to refer again to Dr. Orton, because he uses a pin tooth to construct a bicuspid dummy and removes his pin tooth and solders the connection between the abutment and his dummy, near the occlusal surfaces, leaving the free space for the gum septum. Most dentists in the past have seemed to forget that any such thing as the necessity for a healthy gum septum ever existed, and they have tried to obliterate it by filling with solder between the dummies and the adjacent margin, so that when they set the bridge the gum septum was pushed away.

Something was said about crowns versus amalgam. I want to go on record as saying that no tooth that can be filled with amalgam should ever have a crown on it. Any man in the dental profession who so far traduces his profession as to insert a gold crown when an amalgam filling is the logical method of saving that tooth, is not worthy to practice our profession. I thank you.

Dr. Claude B. Brownell (Peoria, Ill.):

As you all know Dr. Prothero, it is needless for me to state that I did not receive a copy of his paper, and not being gifted with any great amount of imaginary powers, I had no idea what he would say.

However, if Dr. Prothero will pardon me for seemingly diverting the thought which he has instilled in your minds, I will make a few remarks on the present trend of crown and bridge work through my observations in the dental laboratories in the past few years.

Dr. White spoke of so much work being done by the dental laboratory man. The majority of us expect the dental laboratory to do the dirty work only, but it seems that many dentists expect it do do everything but collect the fees for the operations.

I have seen many modeling compound impressions of a tooth to be crowned, sent to the laboratory without even a measurement,—and the tooth had not been touched with stone or cleaver,—and expect the laboratory man to manufacture a crown and then make the tooth to approximately fit the crown instead of the crown to fit the root as it should be.

Under these conditions it is no wonder that crown and bridge work is condemned, especially by many of the medical profession, also many of us who are not overly enthusiastic about gold crowns.

As Dr. White has said, if a tooth can be restored with a good amalgam filling, it is a crime to put a gold crown on it.

As to the kind of facings to be used,—personally I use only interchangeable teeth—for many reasons; it is not necessary to subject them to the heat, they are more easily repaired, and in case of recent extraction, you can set a permanent bridge and if the gums recede you can easily put on a longer tooth.

I think that the majority of the crowns and some bridges that were put on previous to the last four or five years would not have been necessary had the teeth been properly built up with gold inlays or amalgam fillings.

When bridges are put on with such crude preparation as has been mentioned, it is an injury rather than a benefit to the patient and a disgrace to the profession.

Dr. Geo. H. Henderson (Springfield):

I want to emphasize one point, and that is the kind of teeth that are crowned—that should not be crowned at all. A few years ago I called on over three thousand dentists in a good many states, and I was in a good many laboratories, and I want to tell you that the impressions that are sent to the laboratories to be crowned or bridged are a disgrace to the profession—teeth that have less than one-fifth of their surface gone, sent in there with the impression—and just a small cavity—asking that a crown be made, and I saw two cases where the laboratory man was asked to crown them and the pulps were not destroyed for ten days after he was asked to make the Richmond crowns. It is the almighty dollar—that is the trouble. It is lack of conscience in our profession, and it is no wonder we are getting fits from the medical profession. We deserve it. There is lots of good work being done by laboratories; some can do the work better than the man that sends in the piece; but how can he take a model in seventeen pieces and expect a bridge to be made in one piece. I am telling you facts, gentlemen; I have seen it. We will have to get down to honest, conscientious efficiency. We must settle down and stop trying to get the dollar too easily.

Dr. K. G. Knoche (Chicago):

The thing I want to emphasize is something that Dr. White touched upon, and that is the matter of standardization. I wish the men who are interested in crown and bridge work would make a concerted action and either form a society patterned after the orthodontists, or rather, make it a branch of the dental society, and get together and thresh this subject out and arrive at some solution of the problem so that there may be some standard. Some one has said that nothing is scientific without a standard, and if we gauge our dentistry by that definition we find there are just about two branches that are standardized, and one is the cavity preparation standardized by Doctor G. V. Black, and the other is orthodontia classification standardized by Doctor Angle. In regard to this question of standardization I believe very few men who are doing crown and bridge work would not be willing to give up to the theories of the majority of those interested, after conscientious examination of all the facts, and this would set up standards whereby we could practice. I have my own pet theories regarding different points in crown and bridge work, and I think the chief principle involved in this work becomes the chief principle underlying all of our changes, physical and otherwise, of the body—that is, that we should look at this subject first from a physiological standpoint. I do not believe we can study it from the pathological standpoint without first having some understanding of the physiological. If a point were to be decided by the men interested and against me, I would be in favor of the majority.

In regard to the paper, strictly, I was glad that Doctor Prothero ended with the statement that the trend of modern crown and bridge work is toward conservatism. I would like to add that the trend is towards standardization. In eugenics they are trying to standardize the babies, and in other things attempts at standardization are being made, and I do not believe it is possible to longer disregard the fact that we must come to some understanding as to standardization.

Dr. F. E. Roach (Chicago):

I realize that you are all pretty well tired out, and I cannot attempt any lengthy discussion at this time. The question is one of vital importance to every practicing dentist. I believe our trend is away from a betterment of our crown and bridge work. I have made this statement before and I have had no occasion to change my opinion. One reason for this trend away from better crown and bridge work, and better prosthetic procedures generally, is the dental laboratory. I believe it is the curse of the dental profession today so far as prosthetic procedures are concerned. I have no fight against the dental laboratory. I believe it is a necessity and there are many men employed in these laboratories that are splendid mechanics, capable of doing the very best quality of work, provided they are given an opportunity. We should send these men good models and impressions, with instructions in a definite way that they may understand how we wish the work done, and in that way we can get very good service from the laboratory.

Mush bites and wax impressions for dentures and plaster impressions of teeth to be crowned will not produce good results. Taking impressins of teeth without first having prepared them for crowns with the idea that the laboratory man can make a crown to which the patient may be subsequently fitted is ridiculous and yet this thing is done right along. Is it any wonder that our crown and bridgework is condemned? I emphatically agree with what Doctor White said that this work should be done by the dentist himself. It is worthy of our best individual effort. There is no field in the whole realm of dentistry that is of more importance in the treatment of the ills of our patients than that of the proper construction of crown and bridge work, so that my fight, if I were to have any, would be against the indiscriminate sending of all of this work to the dental laboratory.

Another great mistake that is being made by the profession is doing this work without careful study of the conditions; doing it by rule of thumb too much, and because we find spaces in the arch we are too apt to jump at the conclusion that fixed bridgework is the only thing, when as a matter of fact it may not be indicated at all. On the other hand, leaning too much toward removable bridge work and putting it in when it should not be done. The occlusion, the length of span, the number, condition and location of the remaining teeth and many other things should be considered carefully before deciding a plan of construction.

As to standardization, the standardizing of any kind of procedure is the proper thing. We know there are men already working along the line of standardizing crown and bridge work. Doctor Orton has spent considerable time in an attempt to do so. Just what can be accomplished in this direction I do not know, but with all the standardization that may be brought about, we know the tendency of men, regardless of what their teaching may be. We may spend our best efforts in teaching young men these standard methods, but they go out and find they have to compete with older men in practice, and the advertising men and the class of work that is not made along standard lines, and that, together with the inherent nature of all of us to shirk our responsibilities, and that tendency to go in the line of least resistance, and the very fact that crown and bridge work—fixed bridge work particularly—can be done in a slovenly, indifferent way and then cemented to the patient so he cannot get away from it, makes for apparent success long enough for them to get the fee, and this is too often accountable for much of this work being done in an improper way.

To my mind the greatest trouble we have to contend with is to get the profession to take a personal and individual interest in the betterment of this class of work.

Dr. J. H. Prothero (closing):

The report of this investigation, the parts of proceedings, the cases of fixed bridge work which I read have been put to shame. Doctor Dexter did not express half the dissatisfaction that has been expressed today. I heartily agree with what has been said. I am not an advocate of the application of fixed bridges in every case or in very many cases. I do think there is a place for fixed bridge work. And I think if we should standardize certain things the principal thing should be the code of morals of the dental profession. A man ought not to do crown or bridge work unless the conditions presented demand it, and until the dental profession look at crown and bridge work in that light they are not treating their patients right and are not acting honestly.

I do not believe a system of standardization, as far as bridge work is concerned, can be promulgated and put into practice, for two or three reasons. As long as the physiological and pathological conditions which are now present confront us, as long as the personal equation exists, there will be differences of opinion, and standards will not be agreed upon.

DISCUSSION OF DR. COOLIDGE'S PAPER "THE PREPARATION AND FILLING OF ROOT CANALS.

Dr. G. C. McCann, Danville:

It is a privilege to be one to remark with approval the presentation of this subject, which as the paper states, creates a vital possibility, in effect; to the life of every patient for whom we may treat a tooth. Men who have given this subject ardent and untiring study, as well as our essayist, narrow us down to the statement, that even one-half of the perfect root fillings show evidence of apical infection. Acknowledging this to be true—where are we? Will a technic, such as given us for a perfect root filling, show after a time, that the perfect half still have evidence of apical infection?

At the outset the paper states the percentage of failures are due to the imperfect and perfect fillings in roots. Since working more thoughtfully in this branch of our work, I have come to question if some of the failures are due to the perfect or imperfect root filling. I refer to the methods and results of devitalization. I believe that the horrid percentage of failures date back to the time when the tooth was predisposed by a mild or serious apical inflammation and septic condition. A something which occurs about 60 per cent of the time. A condition is set up which does not show in radiographs. A predisposition is left, which I believe is the cause of the subsequent revelations now blamed to root fillings. Is it not reasonable to suppose that a tissue so delicate as we know the peridental membrane to be, is not sure to recover? Do we not know that gingival irritation of this membrane causes subsequent havoc? Why not consider the apical irritations which are set up through devitalization and from putrescent pulps as equally grave, and as much responsible for subsequent failures as our impossible root fillings? Since hearing and seeing the work of Dr. Callahan two years ago, I realized a more careful consideration was demanded of us in root work. As I worked it moved me more and more to the necessity of seeing what I was doing. I purchased an X-ray. Then I found again: where are we? In this particular part of our work there is only one course, that is the carrying to the letter of the law the details of the method you have just seen and heard, for aseptically closing the apex of a root. There is no selection, no substitution of material to meet the purse of the patient. It is there—that we are. The method and detail is not the large end of the work. The large end I found is to educate our public that it will cost as much or more to aseptically and definitely close that little apex, as it will cost to close the cavity in the tooth through which it is treated. I believe that the average man who has the courage and faith to profitably spend a few days here, has the ability to perform the technic of this work. I also believe that if each man here were to go home and with the confidence of his patients, do all that he knows should be done to make a perfect root filling, as conditions are today, there would not be enough dentists in the United States to take care of the state of Illinois. I had an X-ray. I, as well as every one of you, have a few of the ultra class, but in the main a good general class to work for. I know how to do the work they should have. But I could not afford it. Why? They are not educated to it. I had one very good patient remark that he was knowingly taking a more serious gamble with his health, than the end of a tooth that may go amiss. It is the rich who have the money that get the best we know, as do the poor for the opportunity to try out our plans. But what have we for the great middle class? I contend that we can not educate the public in a general way for this ideal treatment, until we have succeeded in educating them that 60 per cent of the root work we are called upon to do is unnecessary. When we have lessened the necessity for root work, then every dentist can do what he knows is right for his patient, and they will look upon a treatment of a pulp as serious, and with possible systemic complications, instead of a harmless affair. Since being awakened on root work two years ago, I have done more sedative and temporary fillings than ever before. Since I cracked open nearly every tooth that I have extracted, to see what kind of a canal it had, I have been trying to get away from treatments. If the percentage of success is so low, the first thing for us to do is to keep educating to keep away from it. Then if necessary educate for the privilege of doing as prescribed.

For condensed thought, conceding that we now know how to handle root work.

First: More education to prevent work on roots.

Second: More care in our devitalization and asceptics.

Third: More education to do root work right when compelled to do it.

Dr. F. W. Gethro, Chicago:

Before discussing this paper I desire to pay my compliments to the essayist for his valuable contribution on this subject. Dr. Coolidge is a most thorough, conscientious dentist and any operation that he attempts will be done to the best of his ability regardless of the amount of effort or time involved. We may therefore feel very sure that everything described in his paper is carried out to the letter in his daily practice.

The methods described by the essayist are so nearly parallel to the methods I advocate that there is little opportunity for real discussion. However, the subject is of such vital importance that one might talk about it almost indefinitely. There is no department in the whole field of dentistry that means so much to the health and even the life of the patient. When we consider how few of the pulpless teeth are properly filled it reveals an appalling condition.

Every detail in pulp removal treatments and root fillings should be performed with the strictest surgical cleanliness possible. We should remember that we are operating right in the blood stream and our success or failure may mean the health or even the life of our patient. The use of the radiograph is of so much importance that I do not believe that a dentist can serve his patients properly or do himself justice without the frequent use of the X-ray and without that education that comes from an extensive experience in the reading and interpretation of the X-ray films.

Dr. Coolidge has used the terms vital teeth and non-vital teeth which is but another way of saying a live tooth and a dead tooth. I am sure he will agree with me that this is not quite correct. A tooth with a dead pulp or without any pulp is not necessarily a dead tooth. It is quite a common mistake for many of us to say that we have removed the "nerve" and the tooth is now dead. We may have removed the pulp but the tooth is not dead. It is a tooth without a live pulp. It may be a dead pulp but not a dead tooth.

For the purpose of teaching root canal filling I divide root canals into two classes—large and small. In the first we would place upper centrals, laterals, cuspids and lingual roots of upper molars, and lower cuspids, first and second bicuspids and distal roots of lower molars. The small canals would include upper bicuspids and the buccal roots of upper molars, lower centrals, laterals and mesial roots of lower molars. My aim is to enlarge most of the smaller root canals by a process of curettement so that they may be filled with much less trouble and much more certainty. In other words I enlarge the small canals so that I can fill them with gutta percha points aided by the use of eucalyptol. The more chlora percha used the more uncertain the operation. The less chlora percha used the more certain the operation.

The curettement just spoken of is best done with the barbed broaches. I do not use acids for I believe they are unnecessary and extremely dangerous. If we have an opening into the canal we may readily enlarge such an opening with the barbed broach of proper size. It is my opinion that acids, arsenic or other strong medicaments are frequently responsible for the destruction of the tissue around the apices of the roots. I have no doubt that they are directly responsible for the abscess cavities around many of the roots. I make it a rule to never place any medicament in a canal that could possibly injure the tissue at the end of the root.

Regardless of conditions or complications there are very few cases where I ever find it necessary to treat root canals more than two or possibly three times before filling the root. As soon as a root canal is surgically clean I fill it. The sooner the better. This does not necessarily imply "immediate root filling."

Root canal treatments are looked upon too lightly—a thing to be done at some convenient time. If it isn't a convenient time or the wind isn't blowing from the right direction we are apt to indicate to the patient that the tooth "isn't ready for filling." There should be a definie appointed time for every treatment and every treatment should accomplish definite results.

I believe that most teeth are over treated—treated too many times. I also believe that comparatively few of the treatments placed in teeth are hermetically sealed. We largely overestimate the value of antiseptics in root canal treatments, and we largely underestimate their value in the sterilization of all instruments and materials entering the canals. I would not hesitate to undertake the removal of pulps in one hundred normal teeth, treat and fill the root canals without the use of an antiseptic or anything else in the root canals. Do not misunderstand we. I will take every precaution, using antiseptics with all of the instruments, materials, hands, etc., so that no infection will be carried into the canals and I will hermetically seal the cavity so that no saliva can enter. Before removal of that filling at the next setting I will apply the rubber dam and sterilize the field of operation. I am not sure that I could not do much the same with one hundred teeth with dead pulps and get as good results without the use of antiseptics in the canals as I would with the use of antiseptics in the canals. We must ever remember that we do not cure. We only remove the cause and nature cures.

The real vital lesson to be learned from a study of this subject is that we should teach more effectively and practice more diligently pulp conservation. I feel that if the profession was keenly alive to the importance of preserving pulps and to the many dangers which follow pulp destruction from whatever cause that at least 90 per cent of the pulps now lost would be saved. The public places little or no value on the pulp and any such general erroneous opinion held by the public on such a simple understandable subject is but a reflection of the teachings and practices of the dental profession. A healthy pulp in a tooth is positive insurance against all of the troubles that we have been discussing in connection with this paper.

Marvin L. Hanaford (Rockford):

It is only fair to say that any extended study of Dr. Coolidge's paper has been impossible to me owing to the shortness of time since the receipt of his copy. However, a single hurried reading even can not fail to impress one with the earnestness of the essayist and induce a feeling of dismay when we consider our shortcomings as measured by the ideals set forth.

If, as the essayist says, only five per cent of roots filled are perfectly sealed and only two and one-half per cent are free from disease, we are led to wonder whether we are on the right track—that perhaps the operation of filling roots ought to be abandoned *in toto*.

This paper can not fail to stir us to the depths and will certainly compel us to change or improve our technique in this most fundamental operation or it must be abandoned. Whether we are at present prepared to go the whole route with the essayist and make the general use of radiographs which he advocates, must be a matter for each individual to decide for himself. We know that the public is recognizing more and more the advances being made in medical and dental practice, including the wonderful revelations of the X-ray, and may be relied upon to respond to any additional demands either of time or money, if assured of up-to-date service.

That phase of the matter, which seems to be a bugbear in the minds of some, will gradually work out and take care of itself.

It then remains for the individual dentist to use his best judgment, that he may not neglect to use the x-ray where necessary on the one hand, or on the other hand fail to use his less expensive "horse sense" when it will answer as well.

Probably aseptic dentistry, strictly speaking, is not at present possible, but the nearer we can come to it, of course, the better.

I have never found a cotton cone such as the essayist speaks of that would go where a finely wound broach will go; so it is my later practice to dip the wound broach in alcohol and burn it off, extinguishing the flame with the chip blower when the cotton is slightly charred; then I am reasonably sure of an aseptic dressing.

The rosin chloroform solution works well for me in lower teeth, but I have not been able to work against gravity successfully in upper teeth.

In the latter, reliance is placed on the eucapercha pumped in followed by a hard cone, or in some cases by the cone alone, placed in a canal flooded with eucalyptol or oil of cajeput.

A great deal was said by the essayist and has been said by others, about free access and an enlarged canal, as if that being attained, the rest is easy. I wish to show by a few slides that though it may be easy, the results are not always flattering. Inexcusable, you say, but are you sure you are doing better? These fillings were made by better than average dentists. Is it the fault of the method that they are not better?

No, I do not think so. It is rather the result of dependence on the old idea "Nature is kind; she will mercifully condone our offenses." Pathologists now tell us that we have been presuming on nature all these years—that our obligations are past due and payment, or penalty can not be escaped.

Dr. J. G. Reid (Chicago):

I am wholly unprepared to discuss this paper, because I had no notice until a few moments ago that I would be expected to do so, therefore you will pardon the brevity of what I have to say.

We are now in the second or third cycle of this problem of pulpless teeth, their behavior and what we will do with them. This is no new subject. I remember distinctly, and the records of this society will bear me out when I say that thirty-five years ago this subject of pulpless teeth was as earnestly considered and with as much talent, and those who have been earnest in their effort to get the best out of pulp canal treatment are not doing much better today than they did in that cycle to which I have referred.

In 1880 we had many members who have passed to the Great Beyond, who were great enthusiasts in this very same line of operation, and they showed the work as effectively done as it is today. I remember very distinctly one famous, well-known operator, Dr. H. J. McKellops, who was earnest in his efforts in root canal work. I saw some of the teeth that he showed in this society. He had filled many roots of teeth, which were eventually lost from other causes, which he kept as souvenirs of the work he had done in pulp canal filling. They were perfectly done, not only the pulp canal was filled, but the tubuli of the dentin were filled. If you have any doubt of this, read the records of this society thirty-five years ago.

None of us can deny that the operation of taking care of pulpless teeth is one of the most difficult things that we have to contend with, and one of -the things that we get perhaps as little satisfaction out of so far as the public is concerned as almost any operation that we do. They do not appreciate the service of the conscientious man who works hours and hours to preserve their teeth. But I think we are gradually stimulating and encouraging the public in this direction. I will not live long enough to see the time when we will receive the remuneration to which we are entitled for this work, but I believe the earnestness with which the profession is laboring now will leave its mark on future generations. I believe they will be remunerated fully for the time given to these operations.

I was surprised that such a small proportion of root canals are perfectly filled. I believe candidly that I have better than five per cent success myself. I may be mistaken. I have not had the cases radiographed. But let me tell you this, in the handling of pulpless teeth no matter whether the pulps have been dead for years or for days, we never need hesitate in doing just a little bit more mechanical cleaning than is usually done. The conscientious man will not try to do it hurriedly.

Dr. C. A. Dodge (Chicago):

I want to express my appreciation of this paper. This subject is so big and vital and the need so great that I think it comes as a blessing. Root canal work is sort of an endurance contest.

If you have the patience and perseverance, you may go a long way with it. Some of the early pictures shown by Dr. Coolidge are very discouraging. We think "What's the use? I may get there and I may not." But I believe in an attempt to improve the technique we will overcome a lot and this will enable us to make a far better showing with the X-Ray, and satisfy the physicians that we can do better. Our back is up against a wall now and we must make good.

The large opening in crown of tooth I think is one of the most important things and the first element of success. The cavity well opened, I believe we should follow the canal as far as we can see it with a pointed fissure bur to eliminate the preliminary curves that exist in the molars and bicuspids. With a Gates Glidden drill funnel the entrance of the canal. If I do not do this I risk the stubbing or bending of the point in searching for entrance to canal. The point must be smooth and tapering to follow the fine, constricted canals. The point of broach should be tested on the finger nail or some soft portion of the finger to detect a stubbed point. If there is stubbing or bending it will not follow readily and may impinge on walls in fine constricted canals. The first instrument that enters the canal is the one upon which success or failure hangs. Today we have the Tantalum broach, which resists action of H_2SO_4 for a long time, and they come in carefully graduated sizes. The XXX or pathfinder is very small and flexible and is a most valuable agent in overcoming the difficulties of canal preparation. I prefer a shortened broach not mounted in a holder. When the broach is shortened allow length enough for finger grip when point is at apex. Melt a ball of shellac on broach for a handle. This ball of shellac can be placed quickly, and with the instrument shortened we can sense the curves of the canal more readily than with broach in a holder. The farther away from the point our finger tips are the less chance we have to sense the binding and curves that occur in the canal. If in the pathfinder, the XXX or the first broach used, a slight curve is made at point, I think you will find it of great assistance. If we take a straight instrument and thrust it in, the moment it strikes a curve we stand a chance that the point will imbed itself in the side wall, and this may defeat you from the word go; but if this curve is made, the moment you sense a slight binding, withdraw a little, rotate and then advance, and keep this up until you feel the curvature of the instrument adapt itself to the curve of the canal. If on the withdrawal stroke we do not feel a catching or binding of point we can be sure we are not following the line of least resistance or the true canal. As long as we can feel a slight binding on the return stroke we can be sure we are following the canal; but the moment the broach returns freely we know we have struck an obstruction or point is imbedding itself in wall at a cuve. One of the most important things is the smooth point. When the pathfinder or XXX broach reaches a little beyond the apex the patient reacts; then withdraw a little, pump it back and forth until it moves freely, then remove and take another XXX smooth broach, shortened, with the shellac for a handle, roll this under a file to roughen, but allow point to remain smooth to enable broach to slide freely through canal. We should work from the apex back; this is in opposition to the old way. But in using these carefully graded sizes, starting with XXX and working up to larger sizes, we are able to open more canals today than in the past.

Another important point is that when we introduce the pathfinder XXX broach, if we will place a small bead on the instrument--a bead filled with wax, pushing the point through it—the bead will slide back as broach advances and when we reach the apex and the patient gives evidence of pain the bead will be stopped at this point and we thus have the length from apex to floor of pulp chamber. When through with the first instrument and start with the second, which will be a roughened instrument, we should place a bead on that to correspond with the length of the first one, and in that way when we pass in we have some idea of how near we are to the apex and can avoid wounding tissue at same. A very important thing is the rotation of the point of the instrument to follow curves. Do not try to hurry. First use a XXX, then a XX, until you can use a medium sized smooth broach. Then we are ready for a barbed broach, but it is important to have a fair-sized opening before we use this.

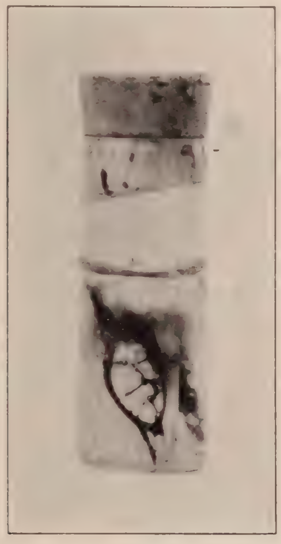
There is another way of opening canals, the way I have spoken of is the thrust or pumping movement. You may use the rotation movement or a half turn in and then reverse and turn out, sometimes one can advance very rapidly in the constricted but rather straight canals of lower anterior teeth, but a new broach must be used frequently as the twisting is a severe test of the instrument.

Dr. E. D. Coolidge (closing):

I have very little to say in closing. I am very grateful for the discussion. I would not want to discourage anyone by these pictures. I feel more discouraged when I lose a canal, than I do because I cannot fill all of these multiple foramina. That occasionally happens, and it is one of the most discouraging things I know of in this line of work.

I think we should all try very faithfully to follow these root canals to the end. I have not had the privilege of X-Raying any of the canals that Doctor Reid has filled; however, I expect that more than five per cent that he has filled are filled well; and many other men in this audience might find their percentage of well filled canals would be very creditable. But the fact remains that patient after patient that comes to the office, especially if you do much radiographic work, will be found with just the kind of mouths I have shown on the curtain. These are not exceptional cases; they are undoubtedly found in the practice of every man who is doing this kind of work at all.

A great many things that Doctor McCann said were splendid. Educating the public to this sort of work is a great problem. I do not think that a man is called upon to do the work purely for the love of it, unless he has some other means of livelihood and he does it from a purely scientific spirit—and that would be a most delightful condition if it were possible. If a man is doing any kind of work and he feels all the time he is losing money by it and his family is suffering because he is donating his time to it, he will not do good work very long. Until we can perform any kind of an operation and forget about money, until we can work for results, we are not going to get ideal results. Sometimes we look around us and see men whom we admire, and love, and respect, who have worked with a true scientific purpose and who have built up the profession and have carried the honors of the profession, who have taught us a great many things, and we often find that in their enthusiasm and in their sincerity, in their honesty and conscientiousness, they have forgotten to be as careful of the practical end of it and have not been as well paid as their services would justify. I believe that this should not be overlooked in the future. I cannot see why a physician, or surgeon, or lawyer can serve the public and come to his old age with a competence from large fees for services with any more justice than the dentist. I think we are doing people an equal service when we treat their



teeth and preserve their general health as well as to restore the beauty and usefulness of the natural organs of mastication. We must not forget this side of our work, and I do not think that any man in dentistry should offer as an argument that this kind of work is only for the man with a millionaire practice, and that it is out of reach of the poor person. We cannot say on what scale any man can do this kind of work, but any man can afford to do the best he can for any patient that is worth while having and the patient will appreciate it and pay him for it. Conditions are different in different localities, and of course we must be guided somewhat by location, but that is not a good excuse to make. Many dentists are falling short of what they know ought to be done with these cases.

I will only speak of one remark of Dr. Gethro, although all were excellent. In regard to the surgical cleanliness without the use of antiseptics at all, I cannot quite see how an infected tooth could be put into a state of surgical cleanliness without the use of any antiseptic in the root canal. I can see how a vital pulp could be removed and the tooth filled without the use of any treatment in that canal; but I understood him to say he could take an infected pulp and make it clean without the use of an antiseptic, in two sittings.

Dr. Gethro:

I did not say I could do that, but I did say that I could take one hundred cases where the pulps were normal, and remove them without sealing any antiseptic in the root canal. Then I said I also thought I might take one hundred cases, even where there were dead pulps, and I did not think it would be necessary to seal antiseptics in these root canals, because by the process of curettement I would take out everything within that canal.

Dr. Coolidge:

I lay equal emphasis upon curettement as upon sealing antiseptics in the root canals. I believe that is the best way to get rid of the infectious material.

There is nothing else which I wish to say except to thank you for staying so long, and if anybody cares to see any of these decalcified teeth I will be glad to show them after the meeting is adjourned.

DISCUSSION OF DR. SEIFERT'S PAPER, "ADMINISTRATION OF THE DENTAL LAWS OF ILLINOIS."

DR. J. G. REID (Chicago):

It is rather difficult to find much in this paper to discuss, for this reason, that it is simply a report to this society regarding the activities of the Board in the administration of the law. It is what the Board is doing, and the question following this is, What will they do in the future? There are opportunities for the Dental Board with which the general professional man is not familiar. It has very much more power than you realize, but one of the great difficulties that hampers the Board is that it never lives long enough to fully comprehend its possibilities and carry the same to an issue. The change in the personnel of the Board is too frequent. It takes several years of active work for members of the Board to become fully acquainted with what is expected of them, and also what they can accomplish. New men on the Board are usually timid, and it takes quite a long time to get a broomstick up their back. I remember when I was first appointed on the Board twenty years ago, it was several years before I became proficient enough to be of any actual service to either the public or the profession.

Speaking further of the powers of the Board, I will use this illustration. The question of preliminary education of men who expect to enter the dental profession is in a chaotic condition. It is in worse condition today than it has ever been to my knowledge. This may seem an absurd statement to make, but it is a fact. Now the State Boards have the power largely to regulate this proposition if they will only do so. The original law in this State was passed in 1881. That law remained without any amendment until 1889. In that year the Board went before the Legislature, and we asked for an amendment which increased the fee for registration of diplomas from one dollar to five. We had no trouble in getting that amendment. No change was made then until 1904, when a practically new law was made, which went into effect July 1, 1904. A large part of that law is now your present law. It has been amended by the last Legislature, and it has been so amended that it becomes one of the best of dental laws. There is not a better law in the United States than the Illinois State

Board of Dental Examiners have today. Our law, with competent men to carry out its provisions, will do its work and do it well. It has in it all that is necessary to meet the demands of the public from that source and also what the profession can expect. It is short and concise, and anyone who will read and study it can become perfectly familiar with it by one careful perusal.

The Secretary calls your attention to the fact that their investigator goes into many offices in which he finds ethical practitioners that do not comply with the law. Now it is the business of every dentist in the State to show to the public that he is legally qualified by law to practice dentistry in the State of Illinois by displaying his license in his office where the public can see it.

Now, as to the powers of the Board. In 1889 at Saratoga, in the National Association of Dental Examiners, of which Doctor Koch of this society was secretary at that time, he offered a resolution to this effect, that no dental school in this country would be recognized by the State Boards of Dental Examiners that did not conduct a three-year school for the education of dentists. Many of you do not realize what a disturbance was aroused at that time by such a resolution, and the educational interests—the school people—rose in a body, opposed to this resolution and asking what right a dental board had to dictate regarding dental education. But it is very much a part of the Board's business to see that the educational work is carried out as it should be, not entirely as the schools think. The schools are fighting, fighting, all the time; they cannot agree today as to what they want to do. It is up to the State Board, it is their business to make rules and regulations that shall be reasonable, and no court in the world will ever deny them this right and privilege if they see fit to do it. They cannot be arbitrary, but they do not have to be arbitrary. It is a quesion of treating everybody alike, and that means reasonable rules. . There were no rules and regulations of this Board to speak of until 1904. In that year a series of rules were made. It required a couple of years before they were in working order, but they did much in establishing certain standards of education to be observed in schools and colleges. Well, they passed this resolution in 1889, at Saratoga, presented by Doctor Koch, as I have said. They all jumped on him, but he said, "Gentlemen, just quiet down and go along and do what the Boards want you to do; that is all we expect of you. We will not recognize you or any of your work until you have complied with this resolution," and they did it. There was no loophole of escape and they had to do it.

And let me say to this audience that there is no more loyal man in this Union than Doctor Koch in the interests of dental education. There is no one man that is in any way superior to him as a man, not only in standing for what are the rights of the people, but what are the rights of the profession, morally and legally. I think that is evidenced by the fact that from year to year he has made the reports of the committee on legislative work, what is being done, and we see the effects of it. The history of the powers of the Board really began in 1889, in Illinois, and is the result of his bringing to the attention of the public and the profession what is meant, what is expected of the Dental Board to do.

Dr. W. F. Whalen (Peoria):

I did not prepare a discussion, because this paper, as Doctor Reid has said, does not permit of much discussion. It tells about the law and about the trouble the members of the Board have. It is a question that all the members of the dental profession are interested in, but the great majority know little if anything about the practical workings of the enforcement of our State dental law. As Doctor Reid remarked, we have one of the best dental laws there is in the United States.

Now, due to the political exigencies, it is not found practical to use the moneys that we derive from fines, assessments and registration fees. It is unfortunate that every two years the representatives of our Board must go before the Legislature with a budget asking for money to conduct the affairs of the Board for two years. When we present ourselves to the appropriation committee we meet with a lot of practical politicians, and anybody who has had any experience in going before a board composed of politicians knows that it is very difficult to get what you really feel you are entitled to. As Doctor Seifert has stated, we pay into the State treasury of Illinois approximately $20,000 every two years, and they give back to us $18,000. We have a self-imposed tax of approximately $5,000 every two years and from examinations, delinquent fees, fines, etc., we raise the $15,000 additional. In view of the fact that the Health Department in its various branches receives practically a half million dollars, and also in view of the fact that in recent investigations great importance is being placed upon the care of the mouth and teeth in the conservation and preservation of health, it does seem that the Legislature of the State of Illinois is treating the dental profession, to say the least, shabbily. I believe that we have a splendid law, and there is not a violator of the dental law of Illinois that cannot be reached and put out of business to stay out of business—but we cannot do it on wind. It takes all the money the State doles out to this Board to pay the legitimate expenses of the Board, and let me tell you that the old Board still has money coming from the State of Illinois, due to the parsimony of the appropriation committee of the Legislature, money paid out of their own pockets, for which they have not been reimbursed.

I have no issue with the chief Executive of our State. He is a man of high ideals, honest and conscientious, but he has been misinformed, and for that and other reasons the dental profession has had to suffer. We have gone through some unfortunate things in the past three years, but today I am thankful to say that we have emerged from these clouds and have a competent, honest, conscientious Dental Board. (Applause.) One that will enforce our dental law if we give them the wherewith to work on. They must have the financial backing. We should have investigators. They need not necessarily be dentists. Dentists really feel timid, and it is not right that we should ask any one of our colleagues to go around in the capacity of sleuth, hunting for violators of the law. I believe we should have enough money provided that we can hire competent investigators. It would be placing the sum right, I think, if the Legislature would appropriate $20,000 to pay for investigators to bring violators of the dental law into court and drive them out of business. It would be a small sum I think. If we had such backing as that, believe me, our Board would make the kind of showing we would like to have them make. The component societies of the State of Illinois could each have a legislative committee which could gather such information in their respective districts and furnish same to an investigator, to the end that we would stop the illegal practicing of dentistry in Illinois. It is a simple thing, but we cannot do it without money.

About the worst things the dental profession has to contend with are the dental parlors. It is like a fence for thieves—when an operator gets into one it takes an expert to find him. They pass men who have no right to practice from one place to another; it is difficult to catch them. We must be prepared with expert investigators, detectives as it were, to catch these people. Everybody in the practice of dentistry, ethically, feels the stigma that is cast upon our profession in having to compete with these so-called dental parlors. We cannot legislate dishonest people honest, but we can legally put dishonest people out of business, and to my mind there is absolutely no place in the economics of dentistry for the dental parlor. Every dental office should be conducted just like every ethical medical practice is conducted. I do not wish to work a hardship on the men who come out of school and have not the means to establish a practice, but we must get rid of the men who are incompetent and never should practice. If these people were cleaned out it would be different, and we would not have the indictment against us that the dentists are not treating the people fairly. If at the next session of the Legislature, when it comes to the matter of budget, we could use such influence with the appropriation committee so that we would have the proper appropriation for conducting the legitimate affairs of the Board, and a proper appropriation for investigators, we will find that we will clean up the State of Illinois as well as any State in the Union.

Now, in regard to preliminary education for entrance to the practice of dentistry. Many sad things came before us when I had the honor to be on the Illinois Board of Dental Examiners—young men coming before us with their credentials and diplomas from the dental college, but with insufficient preliminary education. Under the rules of the Board we could not accept them. They had spent three years getting an education—many hardships and trials and worries—perhaps had borrowed money to finish their terms—to run up against a stone wall just when they thought they were on the threshold of the profession. Now with this commission to examine these young men and prepare them, they will not have this to contend with. I am pleased to know that we are going to have such a board, and Doctor Koch said that the Board would be instructed to keep the papers for at least two years, until after the State Dental Board is through with the candidate and he has passed—then destroy them. Things come up at the last minute and I believe it is important that the examination papers be kept until after the candidate has his license.

Now there is another unfortunate thing. When the original statute to regulate the practice of dentistry was enacted it gave the right to old practitioners who were in the practice at the time of the passage of that law, the right to register without examination. Many of them did, but some of them neglected to take advantage of this opportunity. After a few years the amended law required a diploma in order to take the examination before the Board. Now there are men who feel they are being persecuted even at this late day because they are cited to appear before the Board and show cause why they should not discontinue the practice of dentistry. Good men they are, not criminal; they are not violators of the law like the floating dentists we have mentioned—they are not that type of men. Of course we will say offhand, "It is their own fault," but that is not the point of view. According to the law as it exists today and the rules of the Board, these men are ineligible to take the examination, and I believe that some provision should be made for these delinquent men who are right—some special enactment of the Legislature that would clean up all these things and put these men where they belong. It can be done without any question and we should back it up and see that justice be done to everybody. I hope that some action will be taken to this end.

The co-operation of the schools. We found that the schools were arrayed against the Board—sort of a fight; but let me tell you that today the schools are the greatest supporters, they are the right arm of the Dental Board and do everything they possibly can to make their work easy and make it successful, to the end that the standing of dentistry in Illinois may be placed at the top notch, and everybody looks to Illinois as being the center of dental education.

I had in mind to speak of the status of affairs with the Governor. Many men have censured our Governor for the action he took in summarily dismissing the old Board. I want to say a word in his defense at this time. Governor Dunne was misinformed; he trusted people about him, people who were in his official family who had axes to grind, and when he found this out summary action was taken, they were dismissed. I believe it is poor policy in the change of administration to change the personnel of the Board. Really I believe if it were possible our Board should be entirely removed from politics. I also believe if it were possible we should have in our law a requirement that three of the five members of the Dental Board should be recommended by the Illinois State Dental Society and appointed by the Governor, leaving the Governor with the privilege of selecting two men if he wishes, or if he wishes recommendations for the entire five, that the Society should recommend all the members of the Board. It is a bad plan, indeed, to put out all the members of the Board at one time. Doctor Reid said well when he mentioned that it would take a person a long time to become familiar with the work. I was on the Board four years, and I was really just getting an insight into the work of the Board and beginning to feel I was of some little value. I think at least three members should be retained; the Board should be rotated.

I cannot leave the rostrum without paying tribute to a man whom I presume you all know and know what he has done—Doctor Koch. There is no man in my opinion who has done more for the dental profession in the way of obtaining dental legislation in the State of Illinois, than Doctor C. R. E. Koch. (Applause.)

DR. L. L. DAVIS (Chicago):

I have two points I wish to mention, and the first is that the dental profession of the State of Illinois should know more about this law.

The other is one mentioned by the last speaker, who bewailed the fact that at the present time the Board can only get about $9,000 a year to pay their expenses. When I was on the Board—and I succeeded the gentleman whose name has been eulogized by our previous speakers, Doctor Koch, and I also want to emphasize all that has been said in regard to that man; not only him, but the other members of the Board who preceded me. They worked without remuneration even for time and expenses. They did it as a labor of love and went down in their pockets and bore the expense. In fact, as late as 1894, when I was appointed to the Board, and for a number of years after, we had only about $300 a year to be divided between five men, and as most of the meetings were held in Chicago we paid the railway fares and invited the country members out to our homes so as to save hotel bills. I think the records will show that when I turned in the books to my successor there was due money paid out by the members of the Board—something like $2,000 of actual expense money, and now these men bewail the fact that they only get $9,000 a year, and with practically the same condition of affairs as at that time.

There is one thing that certainly should be provided for, but which has been overlooked by the previous speakers, and it should be mentioned at this time—the great and glorious work that is being done under the new law. We had a law that was fairly good, but this new law is certainly marvellous; but it fails to provide a means for enforcement, and the man who has done a good deal in enforcing that law has been the man who was appointed as investigator, and I think the work of Doctor George N. West of Chicago should be well thought of by you at this time, not only by the Chicago men, but by the Society generally, and I do hope that this Board will see fit to take a fairly good proportion of that $9,000 a year and turn it over to the investigator for the work he is doing.

Dr. O. H. Seifert (Closing):

I want to congratulate the program committee on the men they selected to discuss this paper. I want to say that these gentlemen assisted in laying the foundation, and we cannot help being successful. Our law is a good one, and it keeps you busy to keep track of these laws. It seems like a contest between the States to see who has the best law. We have just heard of New York and Pennsylvania amending their laws.

Dr. Whalen spoke of some money they have coming. I want to say for the information of these men that the present Board is in the same fix, and it was through our generosity that the members of the former Board haven't more coming.

With reference to dental parlors, we think we have found a way to do something with these people. We have already started the ball rolling. . At our next meeting we are to have a number of hearings, and believe me if they let us, there are going to be some licenses revoked—something you have never heard of before in the State of Illinois. (Applause.)

In regard to these men who have been in practice for years, but failed to register in 1881, there are three cases in the State. We gave these men hearings yesterday, and they will be disposed of before the end of the week. It must be taken up through the Attoorney General, but I can see no chance for them. They are asking for a license under the present law.

The question of expense is a serious one. Mr. Roche, Department Auditor of the State, the gentleman who audits our expenses, has allowed what he considers a day's work—400 questions. Do you not think that is a pretty good day's work?

So far as expenses are concerned, there can be no fair comparison between the present and former administrations. The work has multiplied many times; conditions have changed; the law has been amended; the classes are larger; in fact, an entirely new situation confronts us.

THE WISCONSIN STATE DENTAL SOCIETY, FORTY-SIXTH ANNUAL MEETING, HELD AT WAUSAU, JULY 11-13, 1916.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

Dr. W. I. Macfarlane (Tomahawk, Wis.):

Mr. Chairman and Fellow Practitioners. I suppose I might offer as an excuse for not having a discussion of this most excellent address already prepared, the fact that I did not receive a copy of Dr. Krause's paper. This circumstance is due to no fault of Dr. Krause but to the fact that the paper was sent to me by registered mail and was not delivered to me before I left home and I suppose it is now reposing quietly in the Post Office at Tomahawk. This being the condition of affairs, I have tried to make a few notes as I listened to the reading of the paper.

One of the last things which he said was that "in order to get people interested in an affair was to get them to work." That is very true. During the last four or five years I have had some experience along this line and I have found that if we could only get our members of the Central Wisconsin Dental Society on the program once or twice, it was not nearly so hard to get them limbered up afterward.

It is very hard for most men to break the ice, as it were, and get up and speak in a public meeting. But it is like any other thing which we are called upon to do. By repetition it becomes easier. If we can only get our members to attend the meeting, go on the program and enter into the discussions they will take a great deal more interest and receive a great deal more benefit. It is not necessary that you strive to find a subject upon which all can agree. I think the most good comes from provoking a good lively discussion upon some topic of practical value. I often bump into adverse opinions and I always feel that I receive benefit.

While acting in the capacity of Secretary of our Central Wisconsin Dental Society, I have encountered more or less difficulty in securing the co-operation of some of the dentists who practice in our jurisdiction. It is natural that the viewpoint of a man outside the Local, State or National society should be somewhat different than that of the man who is a member of either one or all of these bodies. In order for us to accomplish the most efficient service we should try to get in touch with the outside man and talk matters over in a fair, openminded manner.

In following this thought out, I always try whenever possible to call in person on these men and if possible get acquainted. One personal call will get more results than a dozen letters and will enable the Secretary to get the viewpoint of the man along certain lines, much more effectively than he could ever secure through correspondence.

I find in our section there are quite a few men who say to me, "I am perfectly willing to join the local society but I do not attend the State or National meetings, and therefore I do not propose being railroaded into these Societies." When I meet this statement I endeavor to convey the views of the officers and members of the various societies as I understand them and which seems to me to be about like this: "If the majority of the local members see fit to accept and indorse the By-Laws of the State and National Societies and are satisfied with such an arrangement, why it seems only fair to me that you be broad-minded and liberal enough to receive this point of view and join also. Suppose you do not attend the State and National meetings, I take it for granted that you are at least interested in Dental Legislation."

During the last Legislature they had up Bill No. 615 A. I received some letters from our President and Secretary regarding it and I took the trouble to send telegrams to our representatives regarding this bill. I received an answer from our Rhinelander man as follows: "Regarding this Bill No. 615 A, when this bill comes up, I will work against it." Our Merrill man was notified and he told us if it had not been for the work of our State Secretary the bill would have had a good chance to pass.

The trouble is that Dentists have been asleep in regard to

Dental Legislation. A few fellows can form a clique, send a representative to Madison and have Legislation passed that favors themselves or institutions in which they are interested, while the men at large who are disorganized can accomplish nothing.

If we could persuade the men who are most affected by these laws to join our State Society and help us make a good strong Dental Organization, which will be able to have some influence on the men we send down there to represent us and who make our laws, then we will have some voice in the matter, but not otherwise.

It is true regarding the fact that there are many dentists in the State who do not belong to the State Society. Their contention that they may attend meetings outside the State without being members of the State Society is true, and perhaps for the good of the profession it might be well to have some way of curbing them. This is a question that demands a great deal of careful thought. Each man looks at it from a different angle, depending of course upon the way in which he is affected. If there are some men who are really so mean that they will not join their local society because they feel that they are not getting some personal benefit, it might be well for the outside societies to know about it.

Regarding the four year course. There is no doubt that it will be beneficial. However, I know a great many young men who are not financially able to take a four year course. This will mean a hardship for them. Some of the big men here today took only a three year course and yet they are leaders in their profession. It depends very much upon the man. Some of our men will never make dentists if they were to go to college ten years. But of course the four year course will make a better dentist out of the man who has ability.

The Relief Fund: It seems a pity that a Dental Society should be called upon to create a fund to take care of dentists who have not enough ability to save enough to take care of themselves in their old age. Perhaps some of our members may think that I am a crank regarding the subject of fees. We can not expect the public to value the service which we render, unless we value this service ourselves. Men come out of college without any business training at all. They have no idea what it costs in the matter of overhead expense or how to secure a fair return on the investment which they have tied up in their education. They begin practice and they charge something perhaps as near as possible to the fee received by the other man in the same locality. Whether this fee is enough or not, they do not know. But as long as they have a piece of money in their pocket and the bills for the first of the month have not been received, they think they are making a profit. Why at this rate they will never get enough to buy a Ford automobile—that is what I have—but I hope to be able to buy a Chalmers some day. (Laughter.)

Please do not misunderstand me when I mention this question of fees. I would not infer that the aim and ambition of all dentists should be a large fee and that alone. But I do think that we should be honest in our work, give our patients the very best service that we are capable of, keep abreast of the times regarding methods and treatment, and then ask a fee which this service is entitled to and which will permit us to save something for old age. It is a reflection on the profession that we work in our offices day after day and a large majority of us do not receive fees which are equal to wages received by a plumber or gas-fitter. I think that when the four year course goes into effect it ought to include a chair of business training. I would like to ask Dr. Johnson to have the Chicago College of Dental Surgery install such a chair. If the faculty of the college was to do this and make it known to the profession, I am sure they would be in a position to get ahead of the other fellows in securing new students.

The Research Fund: I received a letter not long ago addressed to me as Secretary of our Local Society, in which the suggestion was made that we increase the amount of our Annual dues one dollar more, this extra dollar to be sent to the Research Fund to be used to further their work. There is some question in my mind regarding this method. I am very much in sympathy with the research work but I am doubtful regarding the attitude of the rank and file of our members toward an increase in dues. At first our local dues were $2.00. When we affiliated with the State Society they were raised to $4.00 and the National affiliation made it $1.00 more. If this suggestion should go through it would increase our annual dues to $6.00. Whether our members would stand for this or not, I am not prepared to say. Their attitude, no doubt, would be influenced to a great extent by the results obtained and by the men who are at the head of this work. There is a great field to be covered and much money is needed.

There are other points of Dr. Krause's paper which I would like to make note of, but as the time is growing short, and there are other men to follow me who are better qualified to discuss these matters, I will not take your time any longer. I thank you. (Applause.)

Dr. C. N. Johnson (of Chicago):

Mr. Chairman, first of all, I would like to ask Dr. Macfarlane why he stopped at getting a Chalmers? Why doesn't he get the best? I believe he owes it to himself to get the best car there is built (Cheers), because I believe a dentist deserves it.

I want first to commend the report of your president and to say that I have enjoyed his address very much as well as the discussion. I want to compliment him not only as President, but also for the business like conduct of his office as secretary while he held that position. (Applause.) It was my privilege to get into contact with him in connection with my work as editor of the Dental Review, years ago and I have been coming in contact with him ever since. I liked that remark of his in his address, that after he had gone out of office, you will find him as a private with the same interest, and working just as hard for the success of the organization as when he was president. If you had that spirit among the members generally the future of the Society would be secure.

I want also to pay a tribute to the secretary you have now, and to second that suggestion of Dr. Krause that you keep him if you can.

The president's address was a good, clear-cut presentation ot the problems and conditions that confront us. In regard to the men who do not join the State Society but attend open meetings, I fear that I can not bring myself to the point of putting up the bars against them. We should have a better conception of real ethics and try to set an example to the man on the outside and even carry his burden for him awhile; get the mean man in the society and then make him decent after we get him in. That may be a dangerous experiment but I believe it will work out. Every time I have to show a certain button or badge before I can get into a meeting I feel humiliated. I believe we ought to show the man on the outside that we have a broad, liberal spirit and that we are willing to overlook something to prove that we have that spirit. We may bring a dangerous element in, but I believe we will do good by that kind of a campaign.

Dr. Krause made most beautiful mention of the men who are gone. You owe more to Dr. Eisen than you are aware of. He was the first editor of your Bulletin and no man who has never edited a journal can have the slightest conception of the difficulty of editing one, and I am going to make a plea in behalf of the present editor. I know what it means to edit a journal and I am going to ask that you co-operate with your editor and send him articles. He is having a harder time than you are. Give him enough material from which he can get out a journal.

I do not wish to appear as attempting to dictate how you shall conduct your affairs, but I do not quite agree with Dr. Krause that an issue of your Bulletin every six months is enough. Raise the money somehow and get the journal out every three months at least; you continue the interest more consecutively by getting it out every three or four months. In running this journal Dr. Eisen did a very beautiful thing for you. You lost a great deal when he was taken from you just as we all lost a great deal when we lost Dr. Black, and I thank the president of this society for calling attention to the memorial that is being started in Illinois. Your president stated that the Relief Fund had reached only twelve thousand dollars. Next Christmas we will have Christmas seals sent to every man of us. If each man in Wisconsin should send back a dollar and then ask for one hundred more seals, and that was done all over the country, what an increase that would mean for that fund; and we would not miss it. I simply make this plea for the Fund and hope that we as dentists will raise the amount, and I know that the committee appointed by the National Dental Association will handle it in the best possible manner.

I want to make reference—and the opportunity is ripe at the present time—for obtaining a perfectly adequate endowment for research work. We will be able to get outside assistance as soon as we give the assurance that as a profession we are willing to back it. The Research building has already created an impression that will result to our material advantage, and if we enter into this work with a spirit of enthusiasm and willingness it will not be long before our Research Fund is placed on a permanent basis. But we must show some interest and enthusiasm before we can gain the interest and support of the public.

Referring to the commemoration of the fiftieth anniversary of this society. It takes a long time to properly prepare for such an event. When the Illinois State Dental Society met for the fiftieth time we had a very large attendance and very large meetings. It would be a glory to Illinois to help Wisconsin commemorate her fiftieth anniversary, and I pledge my aid in every way possible, and the aid of all the dentists in Illinois in this undertaking.

In regard to the suggestion of Dr. Macfarlane that a business chair be established in dental colleges: I will say for the benefit of Dr. Macfarlane that business training has been a part of our course for some years, and I do not know of a dental college that does not give attention to this matter of dental economics. I believe that it is being done in every college to the limit that it should be carried. I know that I have been lecturing on that subject for a great many years. One time a dentist told me that I had no right whatever to give such a lecture, that I had no business to commercialize what was purely a scientific procedure. I said to him—he was a very good friend of mine and I had known him a long time, so I was able to say it to him—"you are the very best example I ever knew of the necessity of business training." He had been a total failure. While I am on the subject I will suggest that there is great danger that this matter of business training is going to leave an impression with the public that we as dentists are degenerating into mere business men and that we are in practice solely for the dollar there is in it; that we are losing our ethics, and that our standard as scientific men is being sacrificed to this one matter of business. Too much of this is carried into all of the professions. We must do justice to our patients, and we must not lose sight of our obligation to the public, without this we degenerate as professional men.

Even if some of the dentists do make financial failures of themselves, I believe that an individual should be able to come into any dentist's office and be relieved of pain whether he has a dollar in his pocket or not. (Applause.) That does not mean that you must not practice good business methods, but you must so act that the young man going into the dental profession will be likely to have an example that you are not in dentistry for the dollar and that he should not practice dentistry for the money alone. If a man has in his heart the correct ethical principles and delivers good service to his patients every day, and then has the courage to ask a good fee he will not suffer much financially.

I want to express my appreciation of being here with you. It is like going back home to be with the Wisconsin dentists. Work together in harmony with your officers as your president has said and by personal contact bring the new man that comes into your organization into your work. It is personal contact that makes men valuable to one another, and as Dr. Macfarlane has said by giving them work you will interest them and make them loyal members of your organization. (Applause.)

Dr. H. L. Banzhaf (Milwaukee):

Your president was kind enough to send me a copy of his address to give me an opportunity of reading it but I did not get to read it, so this is the first opportunity I had of hearing it. I wish at this time to congratulate your president, as a member in the ranks, on his address. The problems of dentistry and the problems of the society have been presented in clear, logical order. I am proud of what he has done for the young man, and I am proud of what he has done for himself.

This is the thirtieth annual event for me; I have missed two meetings—one last year, and one some years back. I would like to emphasize a number of points referred to by the president but time will not permit. I wish to express my pleasure at having Dr. Johnson with us and of having had the opportunity of hearing him. I nearly always agree with what Dr. Johnson says. I may have some differences of opinion, for there are few men who feel for humanity at large as my friend Dr. Johnson does.

Respecting the management of a dental practice especially of the economics, as Dr. Macfarlane said this has been neglected, but this course in business training has been established in nearly every dental college. It has been my privilege as a member of the Council of Dental Education in America to visit every dental college and school in the country and they will do much better work when the four year course is inaugurated. The three year course is overcrowded, the student has not sufficient time to attend to the collateral sciences and to develop finger skill. I believe the coming four year course is the solution of the demand for better trained dentists.

By way of emphasizing the need of dental legislation. It is too much to expect the members of the state dental societies and the colleges to devote their time to improving dental laws. It should not be expected of them; they are liable to lay themselves open to criticism, but the legislators should get their viewpoint through the dental profession. The dental profession should be used as a steering committee to do this work in an organized manner as suggested by your president.

The requirement by the dental schools of a high school preliminary education before enrollment has been a great help. Only one state makes a high school education a requirement to taking out a license, and that state is Pennsylvania. I would like to see Wisconsin be the second state, but unless the officers have the backing of the society and attempt to do this work in an organized manner it cannot be accomplished. I would like to leave this thought with you. We cannot keep at a standstiill while the world is moving on, or our patients and the public will think just what we think of our own work and of our own profession.

Dr. Wm. Hopkinson, (Milwaukee):

I have very little enthusiasm this morning, Mr. President. Dr. Johnson has covered the field fully and Dr. Banzhaf has also done so. The morning is so warm and it is rather late. You all know my sentiments, but I wish to thank you for the privilege of being called on. Thank you.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

STOP!

So many cases have come under our observation recently where the contact points on the proximal surfaces of teeth and fillings have been ruined by cutting them away in the practice of so-called prophylaxis that it seems imperative to call a halt on such work in the most emphatic manner. The legitimate practice of prophylaxis does not contemplate any such desecration as this. In fact, the preservation of the normal contact between teeth is one of the prime requisites of prophylaxis and he who passes a disk or sandpaper strip between the contact points and cuts them down so as to narrow the mesio-distal width of the teeth and loosen up the contacts is not practicing prophylaxis in its truest sense, but is doing infinitely more harm than good. In the minds of some operators there is only the one idea of smoothness—everything else is negligible—and to make the enamel smooth they grind and trim and polish without discrimination, even to the contact points and on the occlusal surfaces. This is not prophylaxis—it is vandalism. To remove every last bit of salivary and serumal deposit from the teeth, to trim overhanging edges of fillings flush with the cavity margins, and then to polish the surfaces of the tooth and filling smooth and bright is legitimate prophylaxis, but it is not legitimate to so deform the tooth that the chief function for which the tooth was made is rendered impossible. The first result of cutting away the contacts is to permit food to lodge in the interproximal spaces, which makes the patient most uncomfortable. He cannot masticate with the same degree of satisfaction as he could before he was given the prophylactic treatment, and he becomes impatient with dental service. The next result, if the difficulty is not remedied by restoring the contact, is to create pockets in the interproximal spaces and start the case on the rapid road to pyorrhea. Thus one of the chief ailments for which prophylaxis is supposed to be practiced is actually brought about by it when performed injudiciously.

What the profession most needs is breadth of vision and comprehensiveness of thought so that they may see and think beyond the narrow bounds of the immediate thing they are doing. There is something else besides making a tooth smooth. It is infinitely more important to maintain the normal function of mastication, and this cannot be done by cutting away the contact points. In fact, be it said, the main factor in keeping the enamel polished smooth is the full process of mastication. The surface of no tooth is ever satisfactory unless wiped constantly by friction of the natural processes in the mouth, such as food in mastication, the friction of the lips, tongue or cheeks. We aid greatly in some instances by legitimate prophylactic measures, but we are never able to wholly compensate for loss of function as expressed in impaired masticating efficiency.

When prophylaxis is practiced let it be done conservatively and judiciously, and let us see no more of the havoc that is being wrought by deforming the teeth.

THE SIXTIETH ANNIVERSARY OF THE ST. LOUIS DENTAL SOCIETY.

To conduct a dental society and keep it active and useful for sixty years is no small achievement. It speaks well for the personnel of the men, first and last, who have carried it on. Such is the history of the St. Louis Dental Society, and on November 16, 17 and 18, 1916, its sixtieth anniversary is to be celebrated by a big meeting, and it is hoped that a large attendance from outside the city and state may go to St. Louis and aid in making this event a most memorable success.

We have not at hand a detailed program, but we know the character of the men they have in this society and we feel like taking it upon us to promise unreservedly a meeting well worth attending. St. Louis is a delightful place to visit at any time, but in November it is at its very best—we have been there in November—and visitors may be assured of a delightful climate. As for hospitality, it is only necessary to mention St. Louis dentists. They are known the country wide for their entertainments and their courteous consideration of their guests. It is none too early now to mark off your dates in November and prepare to attend the meeting.

THE EDITOR'S DESK.

MY PRAYER.

I pray that I shall be patient—patient with the mistakes, the foibles, and even the sins of others. I pray that if I am wronged I shall be patient with the wrong-doer; that I shall count all of the causes which led to the wrong; that I shall search faithfully to see if I may not in some manner have contributed to the wrong. I pray that my patience extends not to myself in case I do wrong to others, that the righteous indignation of my whole soul shall rise up within me to accuse me in all bitterness. I pray that I may have charity—not the blatant kind that builds edifices and dedicates them with blare of trumpet; but the kind that goes down deep into the aching hearts of humanity and forgives a false or wayward step. I pray that the sins of the fathers be not meted out to the sons, that the dismal heritage of disease and pain be banished from the generations of men. I pray that the pangs of hunger be not inflicted on the children of the poor, nor the pride of possession be the chief portion of the rich. I pray for the virtue of humility—not the humility of self-consciousness, but the humility of sacrifice and service. I pray for the blessing of work—not the agonized toil of helpless women and children through greed of gain, but the glorious privilege of doing for the sake of doing, of adding to the myriad means of human thrift and happiness and increasing day by day the material and moral welfare of the world. I pray for hope, that blessed balm of the human soul; for love, that elixir of the human heart. I pray for the rugged path of truth, the high hill of justice, and the boundless atmosphere of liberty. I pray for stress and storm, for heat and cold, for light and darkness—for the constant change which holds within it the germ of virile growth. I pray for reverses to try the temper of my mind, that I may better bear the favors of fortune when they come. I pray for breadth of vision, for height of aspiration, and for depth of discernment. I pray for purity of thought—the mentor of our every act, the guardian angel of our deeds, and the star which keeps our faces forever turned toward the light—above all I pray for purity of thought. I pray for happiness, not the false and spurious happiness which grows in a heaven of lure and lust, but the happiness which falls as the gentle dew from the vine of virtue—the happiness which comes from doing good and being kind. I pray that I may be like other men, with the same hopes, the same desires, and the same trials—that there be no aloofness in my life. I pray that I may live and labor with my fellowman. I pray that I may be blessed with friends and companions; friendship the flower, and companionship the fruit of earthly experience. I pray that I may love and be loved as long as I live, that I may bask in the sweet savor of that rarest plant of human life, and close my eyes at last to the soothing melody of loving lips.

And in praying for all of this I make the prayer to myself, knowing full well that the answer lies for the most part with the one who prays.

BOOK REVIEWS.

Gould and Pyle's Cyclopedia of Practical Medicine and Surgery, with particular reference to diagnosis and treatment. Third edition, revised and enlarged. By R. J. E. Scott, M. A., B. C. L., M. D., New York. 653 illustrations. Price, $12.00, net. Published by P. Blakiston's Son & Co., Philadelphia.

The comprehensiveness of this work cannot be imagined without an examination of the volume itself. It treats of every known drug and every known disease, giving the etiology, symptoms, diagnosis, prognosis and treatment. It is all epitomized in such a way as to make it readable and instructive without being tiresome. No fewer than eighty-five contributors are represented in the volume, among whom we find the name of one dentist, Dr. W. H. G. Logan, of Chicago. This book will prove of value to dentists for purposes of ready reference to the character of many diseases with which dentists should be familiar, but which, in the course of their ordinary reading, they do not encounter. We commend it most highly for this purpose.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Identify the Karat of Solder:—Cut 18-k. in diagonal pieces and 20-k. in squares.—*Francis E. Burnett, Chicago, Ill.*

Metal Matrices for Silicate Fillings:—Take S. S. White steel strips for matrices, parafine both sides well, and use instead of the celluloid. It is much thinner and stronger. The parafine keeps it from discoloring the cement.—*P. A. Pyper, Pontiac, Ill.*

Applying Devitalizing Fiber:—First fill the cavity with white temporary stopping and make a small hole in the stopping through which to apply the devitalizing fiber. Cover this with pink stopping and you know just what you are doing.—*James W. Cormany, Mount Carroll, Ill.*

To Separate Teeth:—An easy and simple method is to use ordinary wrapping twine, tie a knot in center of it and draw between teeth with knot on the lingual and tie again on the labial, drawing the knot between the teeth. Leave for twenty-four hours or more.—*E. T. Evans, Decatur, Ill.*

Irrigating Antrum Cases:—For irrigating antrum cases use a piece of glass tubing on the fountain syringe hose and to this attach a nursing bottle tubing for insertion through the opening into the antrum. The glass tubing serves as a handle and the flexible tubing will not cause injury to the mucous membranes.—*F. A. W.*

In putting synthetic porcelain on front surface of gold inlays to hide the disagreeable gold color, I have noticed that very often the synthetic turns dark from the reflection of the gold. To prevent this use Caulk's cavity lining with a little cement powder (color to suit), having this quite thin, quickly cover the gold surfaces on the inside of the cavity and after letting it harden for a few minutes proceed with the synthetic filling.—*C. E. Allshouse, Chicago, Ill.*

To Handle Facings:—In adjusting facings, when assembling a bridge often times some difficulty is experienced in taking the facing off. To facilitate this removal, take a piece of sticky wax and make fast to the labial surface of the porcelain front and by means of this wax a convenient handle for manipulating the facing is obtained and the facing is easily at your command—on or off.—*Grafton Munroe, Springfield, Ill.*

Plain Articulator All That Is Needed:—The lower jaw is not calculated for use in a normal way in the case of dentures in mastication, but adapts itself to new conditions by practice. This is demonstrated by the fact that it is very difficult to masticate tough meat or other tough substances because they require grinding, and this is impossible except in some favorable condition of said dentures. Consequently the plain articulator, which I have always used, is only needed, as the movement of the jaw is a crushing one.—*L. P. Haskell, Chicago.*

Cast Gold Fillings for Porcelain Teeth:—Prepare cavity in porcelain tooth, gum-section, or crown in a manner similar to that for the reception of a foil gold filling, namely, outline the cavity with carborundum stone, then undercut deeply with diamond disc, being careful to leave the margins well supported. Then fill cavity with regular inlay impression wax, carve off flush with margins and contour to the desired form; place sprue wire in the center of the wax surface and invest, tooth and all. In heating up the case, be sure to heat with blow pipe from bottom of case, so that porcelain will heat up evenly with investment, otherwise there will be great liability of breakage. When the bottom of the sprue hole shows a dull red, cast with preferably 24-k. gold and allow to air cool. Remove from investment, cut away excess of gold and polish. By following this procedure, one will procure a beautiful and substantial filling, free from flaking so common to many foil fillings of this class. No cement can be used, nor is it required, as the margins will be perfect. It is a great time saver to the busy dentist, as most any assistant can be taught to do the work after the cavity has been prepared.—*C. B. Hebble, Columbus, Ohio.*

How to Repair the Defective Margin of a Gold Casting.—For all defects in margins, except the gingival in the interproximal space, proceed as follows: Take a piece of platinum foil 1/2000 of an inch thick, cut a piece a little larger than the defect in the casting, place in the cavity at the point where the defect comes, conforming it to the cavity wall with light pressure; place casting in cavity, which holds platinum in place, burnish platinum to enamel margin, press on a little soft beeswax, sticking casting and platinum together, remove and invest in Goslee's investment compound; remove wax, dry out immediately, flow on 22-k. solder, disk off surplus, and your casting fits perfectly. This can be done in fifteen minutes. Twenty minutes is ample. For gingival margin where defects are most common, with small spatula melt onto the margin of the casting just about wax enough to fill the defect, place in cavity, forcing casting to place, pass a warm burnisher into the interproximal space, removing any surplus wax. Satisfy yourself that there is no surplus wax under the casting other than the defect, remove the casting and wax, cut a piece of platinum just a little larger than the wax, sufficient to lap over the enamel margin, about 1 millimeter; conform this platinum to the wax with slight pressure, insert casting, wax and platinum all at once, force casting to place while you burnish platinum to enamel margin, remove, invest, and solder as above. I have never had occasion to repair a defect in the interproximal space, but am satisfied it can be done this way much quicker and easier than making a new casting.—*C. C. Corbett, Edwardsville, Illinois.*

MEMORANDA

IOWA STATE DENTAL SOCIETY, NORTHWESTERN DISTRICT.

The Northwestern District of the Iowa State Dental Society will hold its annual Clinic and Manufacturers' Exhibit November 8-9, Martin Hotel, Sioux City, Iowa.—C. E. Westwood, Secretary.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next examination of the Illinois State Board of Dental Examiners will be held at the Chicago College of Dental Surgery, Chicago, Ill., commencing November 13th at 9 a. m. Application blanks and rules and regulations can be secured from the secretary, D. O. H. Seifert, Springfield.

THE NORTHERN ILLINOIS DENTAL SOCIETY.

The annual meeting of The Northern Illinois Dental Society will be held at Aurora Wednesday and Thursday, October 18 and 19, 1916. Cross off the dates early and all come to the best meeting yet.—C. L. Smith, Secretary.

OHIO STATE DENTAL SOCIETY.

The fifty-first annual meeting of the Ohio State Dental Society will be held in Dayton, December 5, 6 and 7, 1916. A more complete announcement will appear in the November number of this journal, but we can promise that a program will be presented of high scientific and practical interest, with many instructive clinics. Mark off the dates now and make your hotel reservations early.—F. R. Chapman, Secretary, Columbus, Ohio.

DRS. L. P. HASKELL AND GARRETT NEWKIRK ILL.

We have to record the illness of two of the standbys of the profession, Drs. L. P. Haskell of Chicago and Garrett Newkirk of Pasadena, California. Both have recently undergone operations, but both, we are happy to say, are improving. Which is only another illustration of the fact that "you can't keep a good man down." In the case of Dr. Haskell it was feared that on account of his age—he was 90 in April last—the issue of an operation might prove serious, and yet up to the time of writing he has made a marvelous recovery, and has surprised everybody—as he always does. Hats off to the Old Roman! As for Dr. Newkirk, we wrote some months ago that it was a pity he did not give all of his time to literature. He now writes to say that during his convalescence he is devoting his entire attention to that pursuit, just another illustration of our qualification as a prophet. But we had no thought of putting him on the operating table to make a literary man of him.

The profession generally will join us in wishing for the speedy recovery of these two splendid men.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

Through the recent action of the National Dental Association at Louisville, the Preparedness League of American Dentists may now be considered an affiliated body, co-operating with it through an advisory committee of five of its members empowered to act with the present officers and trustees of the League. The Journal of the National Dental Association is to be its official organ, through which League members will be regularly informed of all matters pertaining to this great work.

It is the object and desire of the League to aid the War and Navy Departments in every possible way, and it is requested by a representative of the War Department that the League secure, as soon as possible, a list of all oral surgeons who will serve in time of war. Those who desire may, after a satisfactory examination, join the Officers' Reserve Dental Corps with the commission of First Lieutenant.

Units are being formed for the study of the surgery of gunshot wounds about the jaws and face as well as other injuries incident to war which must be treated by the dentist. Those interested in having a unit formed in their locality should so indicate to the League, and immediately steps will be taken to supply the need.

A statement accompanying replies as to experience, college and date of graduation, whether member of National Dental Association or other societies, would be of great assistance in arranging the list. Address The Preparedness League of American Dentists, 3 Professional Bldg., 131 Allen St., Buffalo, N. Y.

SIXTIETH ANNIVERSARY MEETING ST. LOUIS DENTAL SOCIETY.

The St. Louis Dental Society invites the profession to meet with them November 16, 17, 18, 1916, to celebrate the sixtieth anniversary of the society's organization.

An unusual program of varied interest is being prepared for the educational feature coincident with the spirit of commemoration and good fellowship which will prevail.

A report of the recent experiments and proposed investigations of the Research Institute of the National Dental Association, particularly in relation to systemic manifestations of oral infection, efficiency of ionization, and practicability of various root canal filling materials will be given with motion picture illustrations.

A resume of the present radical tendencies in operative dentistry with a conservative course of procedure will be presented by an eminent authority on the subject. Some timely counsel from one whose opinion commands respect.

The complete technic of aseptic root canal operations will be illustrated and described by one of the well known pioneers in this field. Probably no other class of dental operations is being criticised as this, and its requirements are much more exacting than in the past.

A method of utilizing teeth with vital pulps for bridge abutments will be taught by a constructive genius whose technic is an inspiration. This offers a partial solution to the root canal problem.

Scientific construction of artificial dentures with special attention to partial dentures will be discussed by a prosthesist noted for his ability to teach.

Two afternoons will be devoted to the clinical program, all technic of modern practice being on display by men chosen for their proficiency in special phases. A distinctive innovation will be a series of clinical symposiums in which each step of the operation is detailed instead of the finished product being shown with a description of the process.

This is to be a meeting worth any reasonable effort to attend, a composite and the step in advance of all the "post graduate," "cradle of dentistry," "preparedness," "feel at home" meetings of the past.

If you are dead lie down, if not line up with the live ones. November 16, 17, 18.

PATENTS RELATING TO DENTISTRY.

1134833. Dental engine tool guard, Frank F. Fischer and C. M. Kaletsky, New York, N. Y.

1134450. Tooth-brush, Ernest S. Goldy, Haddonfield. N. J.

1134680. Fastening for an artificial tooth, James W. Ivory, Philadelphia, Pa.

1134459. Folding tooth-brush, Loeser Kalina, New York, N. Y.

1134692. Dental marking and spacing tool, Walter L. Mason, Red Bank, N. J.

1134965. Artificial tooth, Albert H. Taylor, Liverpool, England.

1135007. Artificial tooth, Gustav E. Fritz, Chicago, Ill.

1135312. Bridge mold, John G. Miller, Oblong, Ill.

1135922. Brush-guide for dentifrice containers, John Rebrovich, Pittsburgh, Pa.

1135625. Bur-stand, Ralph B. Savin, Philadelphia, Pa.

1135629. Dental articulator, Horace F. Smith and H. S. Dano, Los Angeles, Cal.

1136649. Dental instrument, Harry M. Brock, North Yakima, Wash.

1136100. Dental instrument, Herman E. S. Chayes, New York, N. Y.

1136664. Artificial tooth, Gustav E. Fritz, Peoria. Ill.

1136491. Acetylene blowpipe, Elmer H. Smith, Minneapolis, Minn.

1136492. Acetylene blowpipe, John W. and E. H. Smith, Minneapolis, Minn.

1136184. Dental bridge, George W. Todd and C. D. Mendlik, Omaha, Neb.

1137585. Dental appliance, Thornton Craig, Jr., San Francisco, Cal.

1137482. Amalgam mixer, George M. Hanly, La Grange, Ill.

1137651. Tooth-brush, Elmer Metivier, Boston, Mass.

1137015. Artificial tooth, Frederick H. Nies and J. F. Caretto, New York, N. Y.

1137080. Adjustable chair, Oscar H. and A. F. Pieper, Rochester, N. Y.

1137298. Orthodontia device for influencing the alveolar process and unemerged teeth, Wm. E. Walker, New Orleans, La.

1138355. Dental tool, Cassius M. Carr, Fort Worth, Texas.

1138479. Dental polishing device, Willis L. Hough, Laconia, N. H.

1138568. Tooth-brush, Edgar G. Hubbel, Winthrop, Mass.

1137903. Dental chair, Frank Ritter, Rochester, N. Y.

1137916. Tooth-brush. Joseph Simmons, New York, N. Y.

1138523. Antiseptic tooth-brush receptacle, Robert M. Withycombe, Sydney, N. S. W., Australia.

1139017. Instrument for recementing dental bridges and the like, Edwin H. Crawford, Santa Rosa, Cal.

1138631. Dental instrument, Harry M. Crawford, Lima, Ohio.
1139170. Tooth-regulating appliance, Frederick W. Drissler, Minneapolis, Minn.
1139265. Artificial tooth, Joseph A. Gardner, Memphis, Tenn.
1139028. Artificial tooth, Albert E. Gibson, Philadelphia, Pa.
1139134. Tooth-brush holder, Walter Miller, Beaver Falls, Pa.
1139435. Blowpipe, John M. Morris. London, England.
1139541. Abrading disk, Carl Krug, Frankfort-on-the-Main, Mainkur, Ger.
1139581. Dental tray, Thomas L. Riley, East Cleveland, Ohio.
1139615. Artificial tooth, James L. Williams, New York, N. Y.
1140936. Backing for artificial teeth, Andrew J. Asch, New York, N. Y.
1140566. Dental plate holder, Henry P. Boos, Minneapolis, Minn.
1140363. Impression holder for dental work, Arthur L. Dearth, Boston, Mass.
1140690. Tooth-brush, Harry Lipari, San Francisco, Cal.
1140759. Orthodontia appliance, Christoph F. Montag, Blue Island, Ill.
1140537. Dental bridge and crown, Frank H. Skinner, Chicago, Ill.
1140538. Dental bridge and crown plates, Frank H. Skinner, Chicago, Ill.
1140539. Removable dental bridge attachment, Frank H. Skinner, Chicago, Ill.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solictor of Patents, Fendall Building, Washington, D. C.

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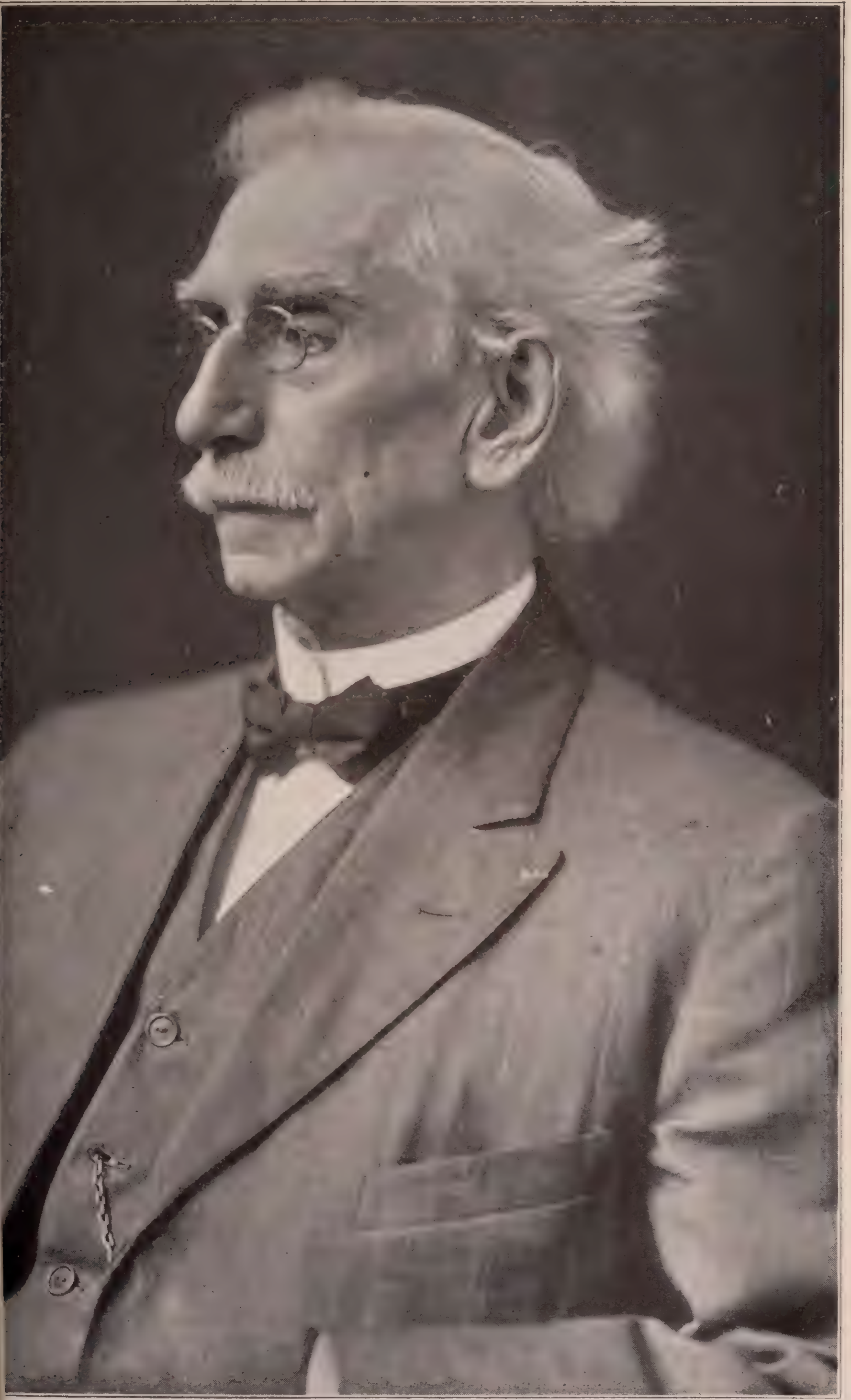


Dr. Loomis Pomroy Haskell, Born April 25th, 1826. Died October 7th, 1916.

THE
DENTAL REVIEW.
Vol. XXX. CHICAGO, NOVEMBER, 1916 No. 11

INCIDENTS IN ABOUT A YEAR'S SERVICE AS ORAL SURGEON OF THE CHICAGO HOSPITAL UNIT WITH THE BRITISH EXPEDITIONARY FORCE, FRANCE.*

BY MAJOR G. E. MEYER, D. D. S., R. A. M. C., ORAL SURGEON OF THE 23RD GENERAL HOSPITAL, BRITISH EXPEDITIONARY FORCE, FRANCE.

Our service, as you understand, was on the western front in northern France and with the British only. If I seem to focus attention on the British army in my talk, it is because my work was with them. If I had had the chance to serve in the same capacity in the German army, my subject would, of course, relate to the Teutons and be in their territory; so I hope that you will not feel that I am taking sides when I talk of the northern part of France. As you realize, the British hold about 100 miles of the western line and the French guard the remaining 300 miles. The British and French armies are quite separate, except that the French guard all the ports, railroad stations and bridges, and maintain dozens of convalescent hospitals within the British war zone.

In order that you may know how the Chicago Unit came to be organized and something of its place in the British army, I will explain: A message came from the British War Office through Sir Arbuthnot Lane to Dr. John B. Murphy, asking for a complete hospital unit of seventy-five nurses and thirty-two surgeons, covering all special departments. Such a unit was organized under the direction of Dr. James Neff, the chief surgeon of the expedition. For my appointment as oral surgeon of this unit, as well as for the training which enabled me to accept it, I am indebted to Dr. Thomas L. Gilmer.

---

* Delivered before the Chicago Dental Society, April 18th, 1916.

Dr. G. E. Meyer,

Col. C. E. Harrison, R. A. M. C., A. M. S. (T)

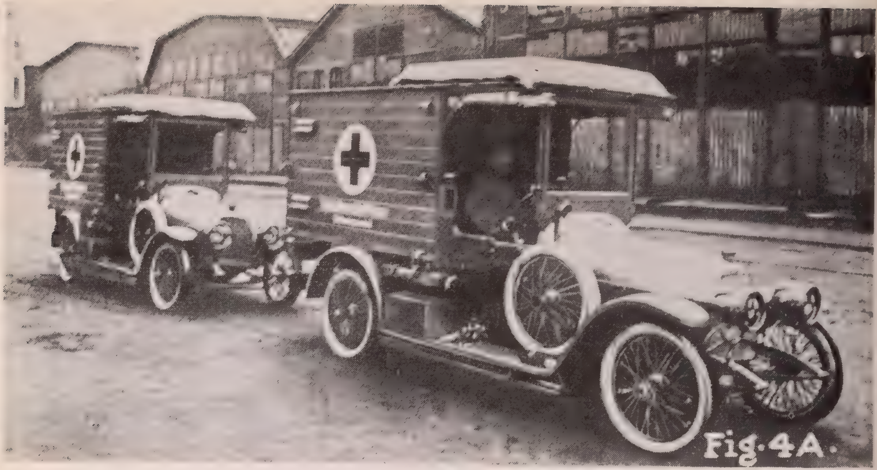


Fig. 4A.

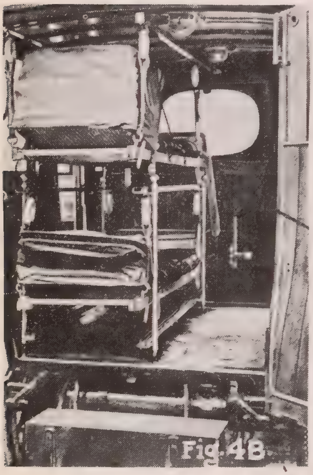


Fig. 4B.

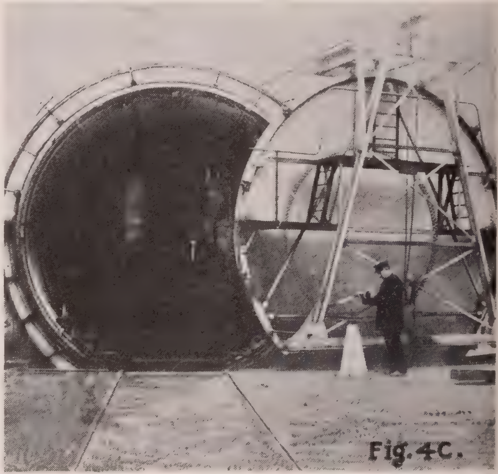


Fig. 4C.

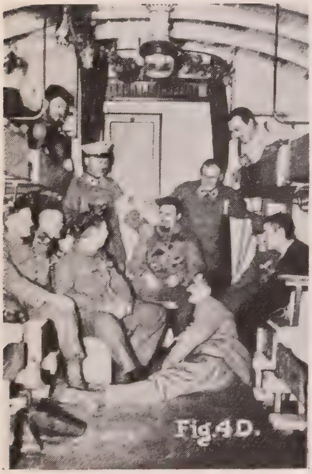


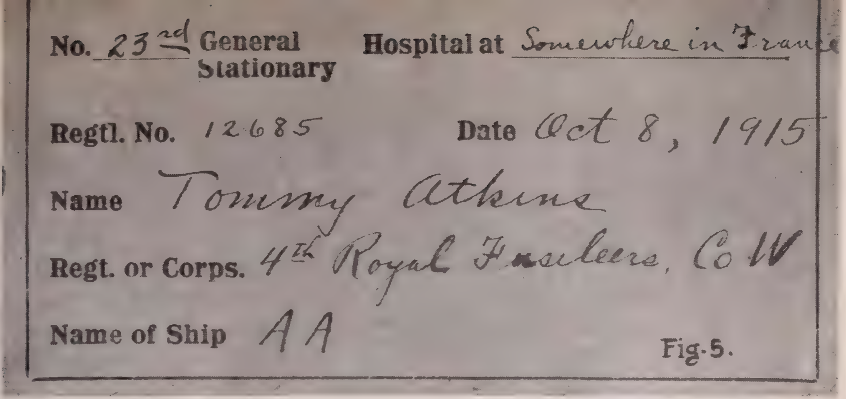
Fig. 4D.

Fig. 4A, B. German motor ambulance, exterior and interior.

Fig. 4C. Tube used to disinfect German ambulance train at one operation.

Fig. 4D. Interior of German ambulance train.

These pictures were given to Dr. Meyer by a surgeon who served in the German army.



No. 23rd General Stationary Hospital at Somewhere in France

Regtl. No. 12685 Date Oct 8, 1915

Name Tommy Atkins

Regt. or Corps. 4th Royal Fusileers, Co W

Name of Ship A A

Fig. 5.

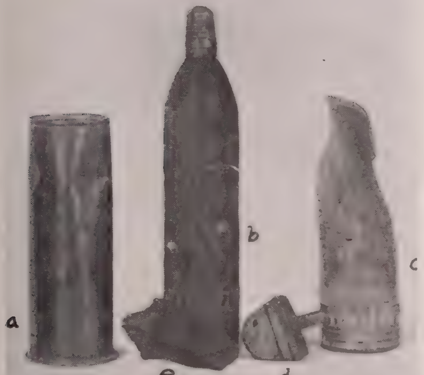


Fig. 6.

Fig. 7.

Fig. 8.

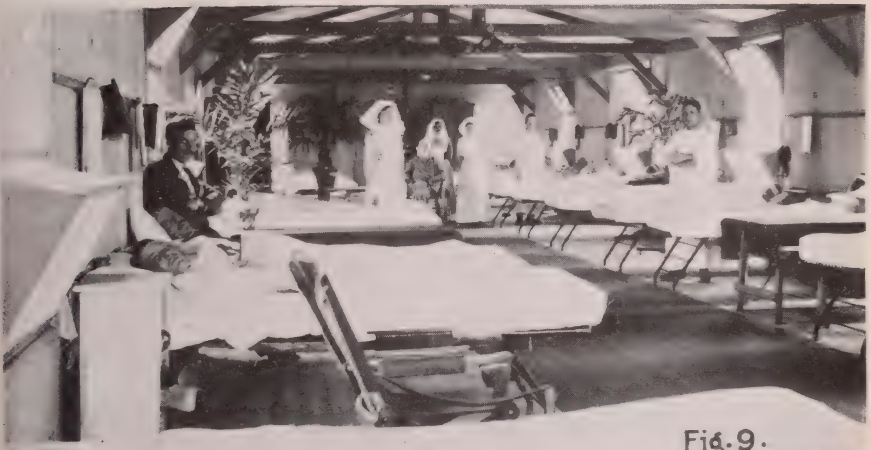


Fig. 9.

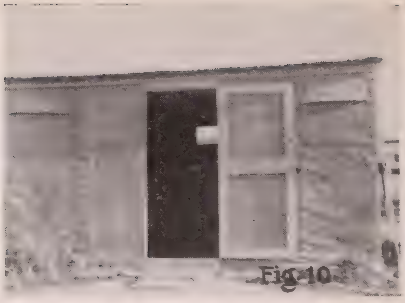
Fig. 5. Tag attached to patient when he enters hospital.

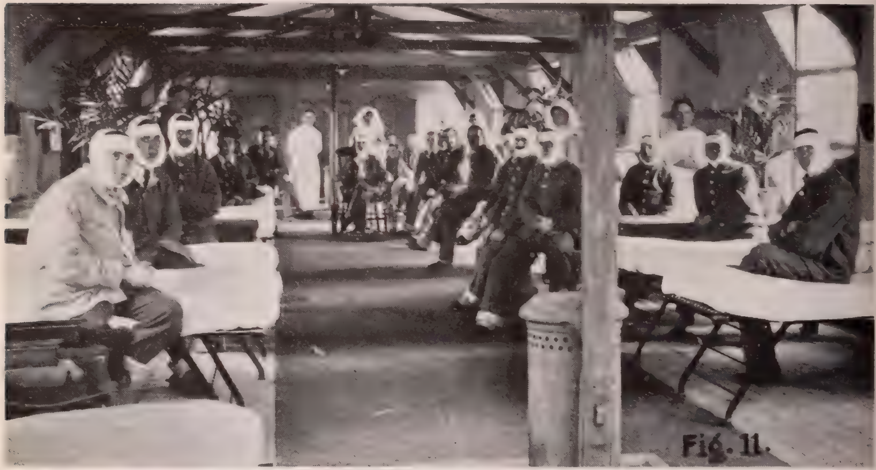
Fig. 6. B is an unexploded French shrapnel, fired from one of the famous 75 millimeter guns. C is a portion of an exploded German 74 mm, shrapnel casing. It fits on top of the cartridge a, which contains the powder to shoot the shell from the gun. Within the casing is a core of high explosive surrounded by a hundred or more small round bullets. The time fuse, d. sets off the explosive within a fraction of a second of the time desired by the gunner. On explosion the flying bullets and casing fragments spread havoc on all sides. E, is a fragment from a 42 centimeter shell of the Germans.

Fig. 7. The beginning of the oral surgery hospital. The Duchess of Westminster visits Major Meyer. Picture shows the Duchess in the lead, with Col. McMunn and Maj. Meyer toddling on behind. Picture taken from X-ray room under perilous difficulties and anxiety.

Fig. 8. The Duchess of Westminster Hospital for Officers. One of the hospitals which sent cases to the oral surgery hospital.

Fig. 9. Part of special T ward for oral surgery, first week.





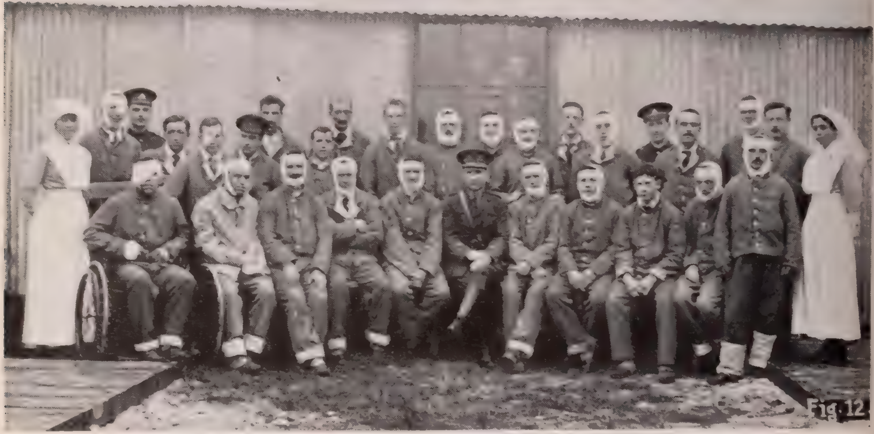


Fig. 10. Hut in which Dr. Meyer lived during his hospital service. A similar hut was used by each officer and each nurse.

Fig. 11. T Ward, five months later showing some convalescent jaw cases.

Fig. 12. Dr. Meyer and another group of convalescent jaw cases.

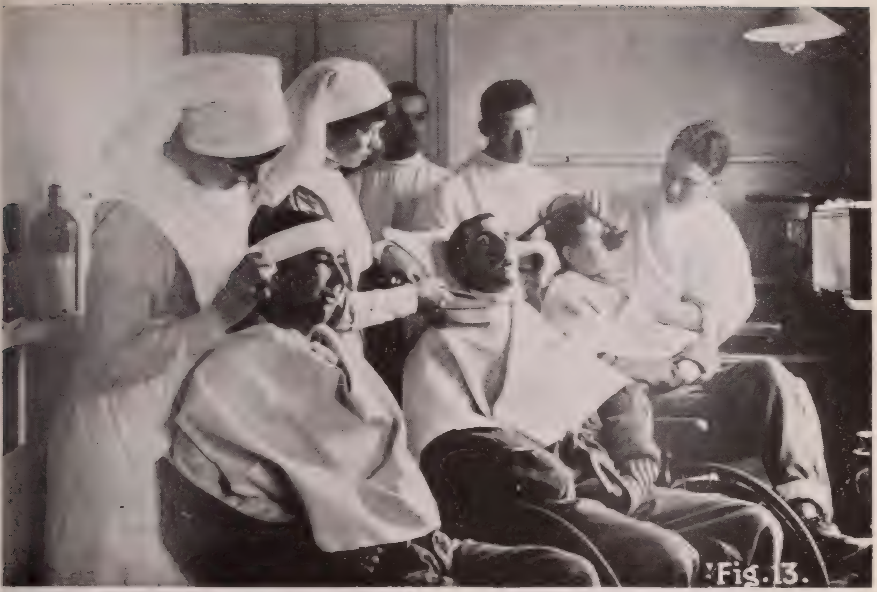


Fig. 13.

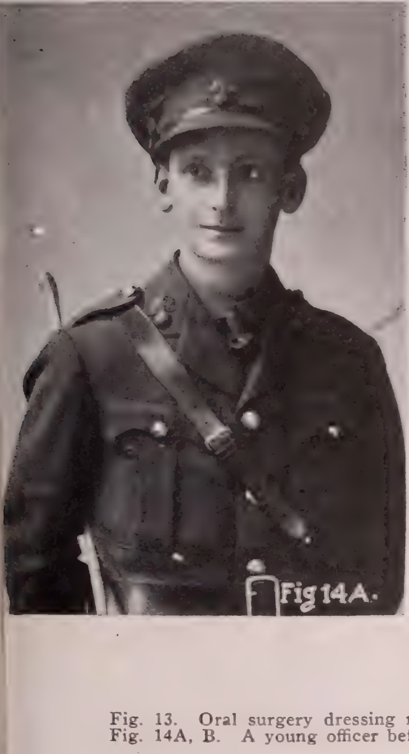


Fig 14A.

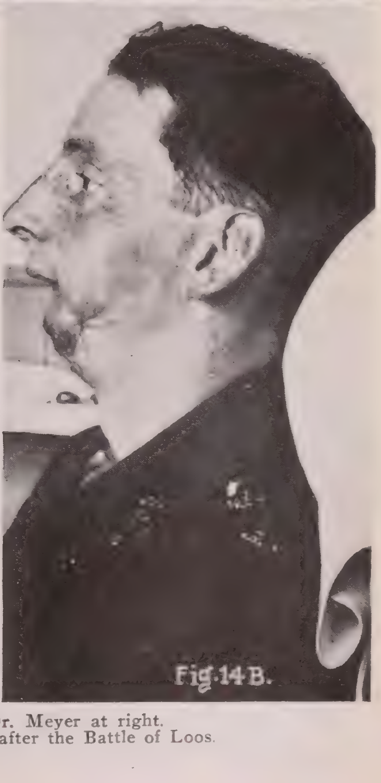


Fig 14B.

Fig. 13. Oral surgery dressing room. Dr. Meyer at right.
Fig. 14A, B. A young officer before and after the Battle of Loos.

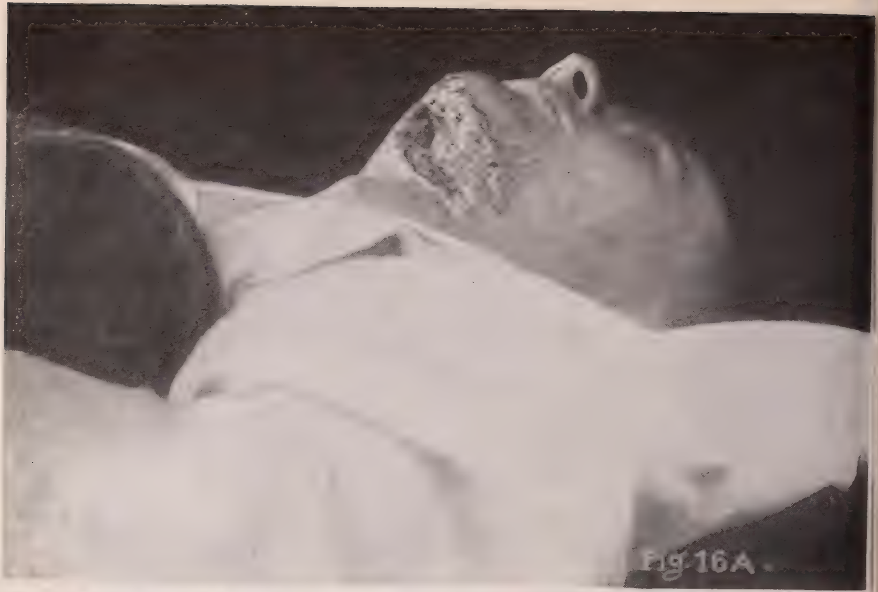
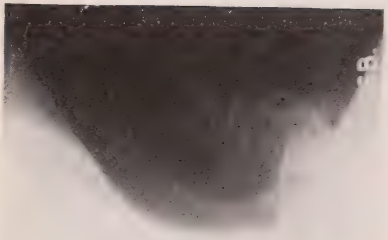


Fig 16A.



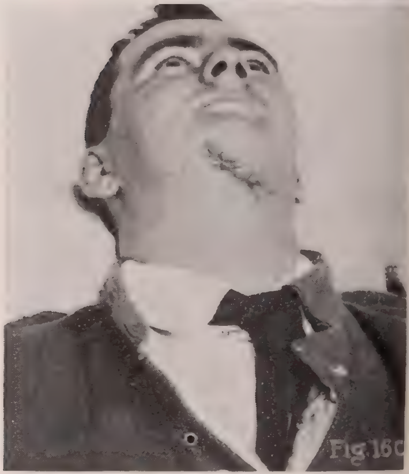


Fig.16C

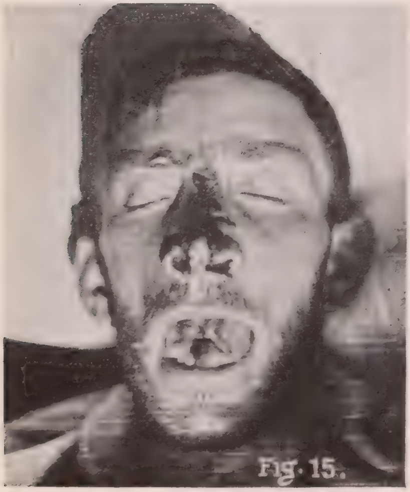


Fig. 15.

Fig. 15. A bullet wound which necessitated a tracheotomy.

Fig. 16A. Wound by shrapnel bullet at close range.

Fig. 16B. X-ray of 16A showing compound fracture of mandible.

Fig. 16C. The same four months later.

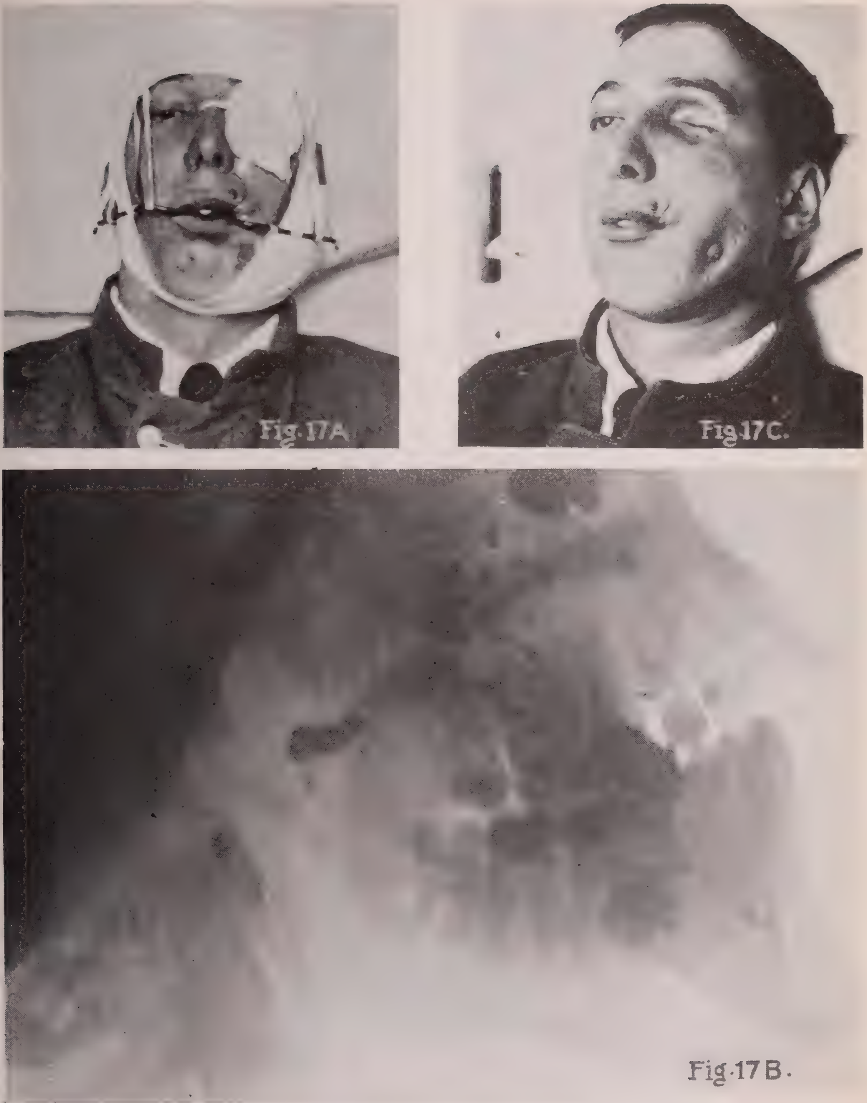


Fig. 17A, C. Transverse facial fracture by explosive bullet.
Fig. 17B. X-ray showing fragments of missile.

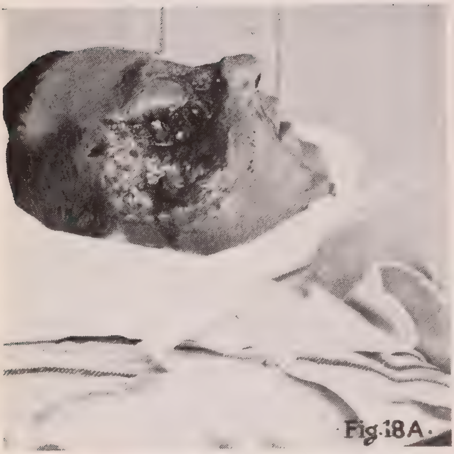


Fig. 18A.

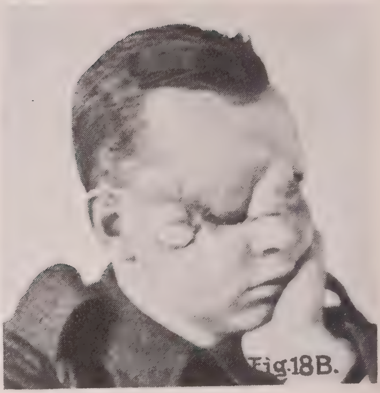


Fig. 18B.

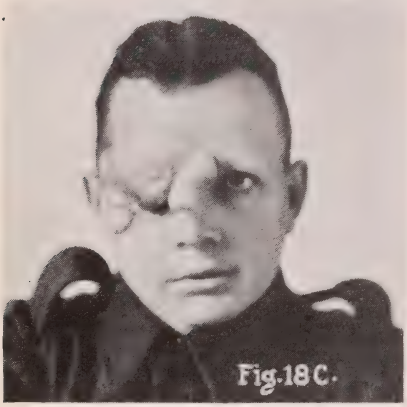


Fig. 18C.

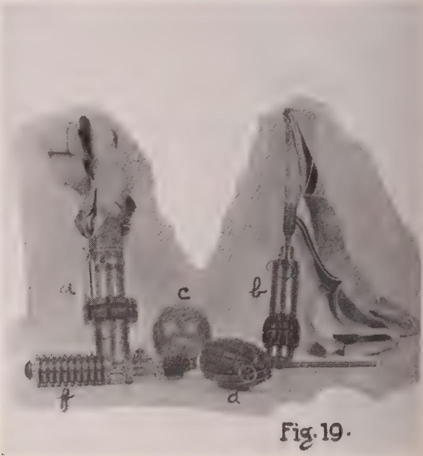


Fig. 19.

Fig. 18A. Bullet wound at short range.

Fig. 18B, C. Successful plastics and bone grafts on patient in 18A.

Fig. 19. A, b, c, and d, are hand grenades. A and b explode on striking. The ribbons make the bomb hit "head first." The impact causes a hammer to set off the detonating cap. C explodes three seconds after the fuse is lit. D explodes four seconds after leaving the hand of the thrower. Even in this short interval the Germans occasionally have time to pick up the bomb and hurl it back. F is a rifle bomb similar to b but fired from the muzzle of a gun by means of a special cartridge.

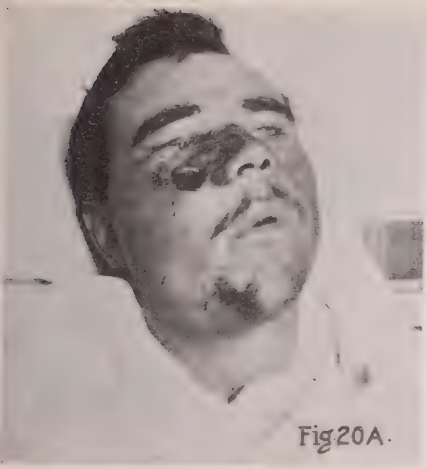


Fig20A.

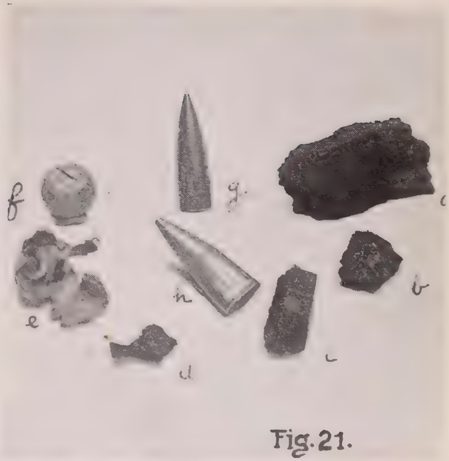


Fig. 21.

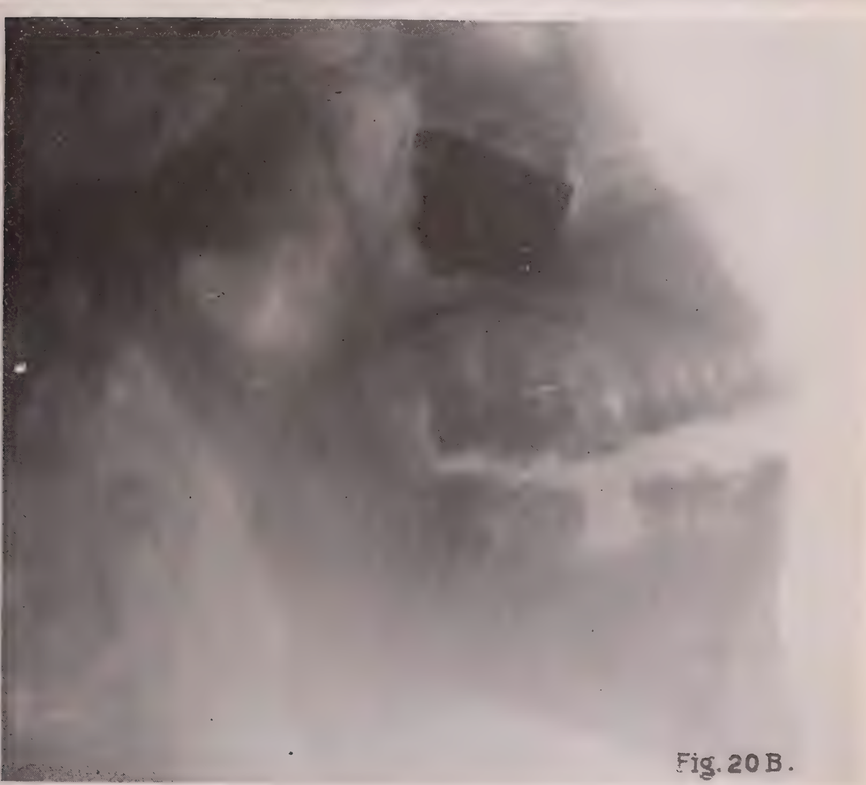


Fig. 20B.

Fig. 20A. Wound caused by a relatively large shrapnel.

Fig. 20B. Fragment which lodged in the antrum.

Fig. 21. A is the piece of shrapnel casing taken from the antrum of the patient in Fig. 20A. B, c, and d are also fragments of shrapnel casing taken from wounds; e is a rifle bullet which exploded after hitting a soldier; f is a shrapnel bullet; h and g are rifle bullets.

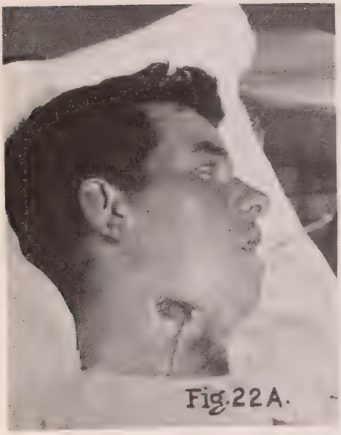


Fig.22A.

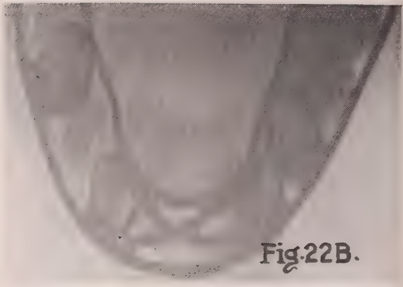


Fig.22B.

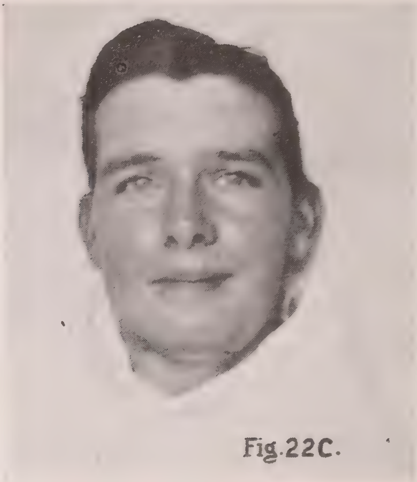


Fig.22C.

Fig. 22A. Bullet wound, resulting in loss of portion of mandible between cuspids.
Fig. 22B. X-ray shows splint applied.
Fig. 22C. Same patient several months later.

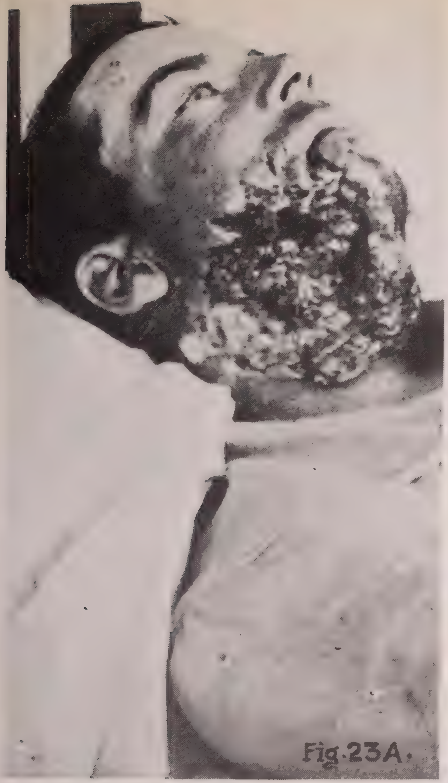


Fig.23A.

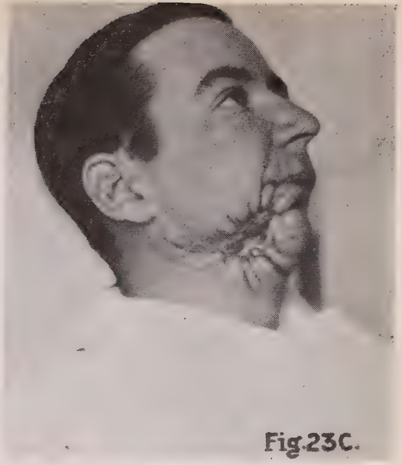


Fig.23C.

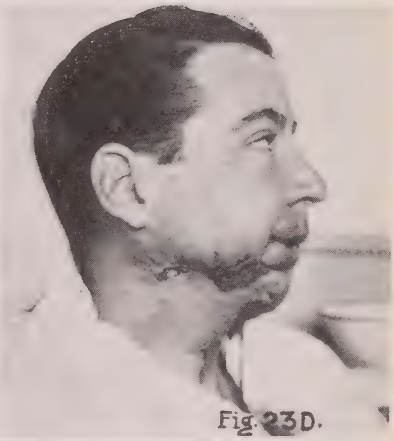


Fig.23D.

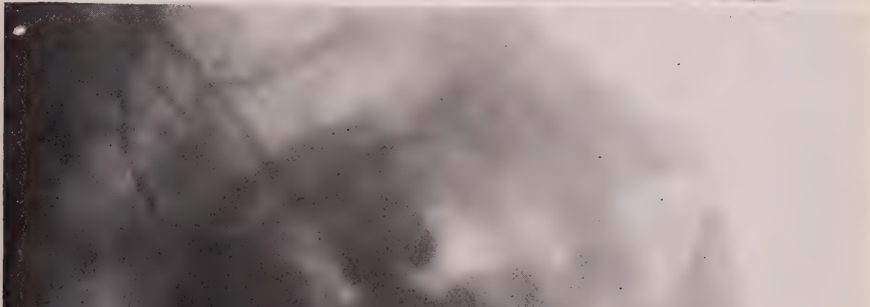


Fig.23B.

Fig. 23A. Complete loss of mandible on one side.
Fig. 23B. X-Ray of patient in 23A.
Fig. 23C. Same patient four months later. 23D was taken after plastic operation and after mandible had been replaced by bone graft from tibia.

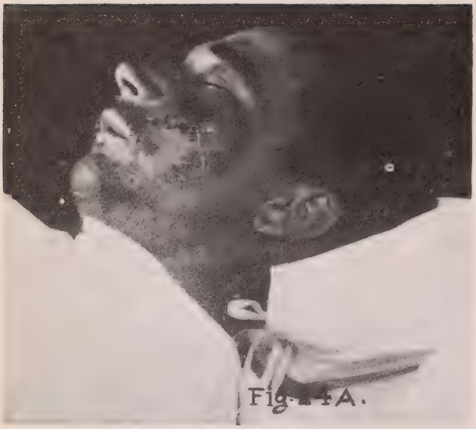


Fig. 24A.

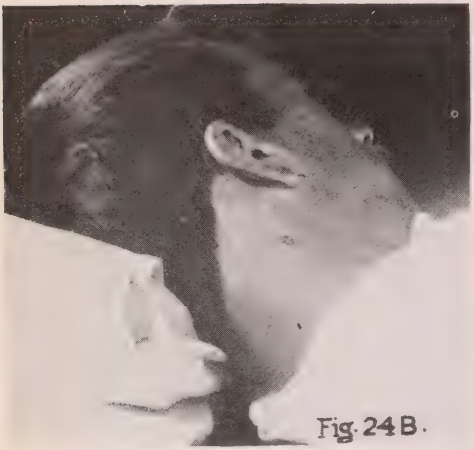


Fig. 24B.

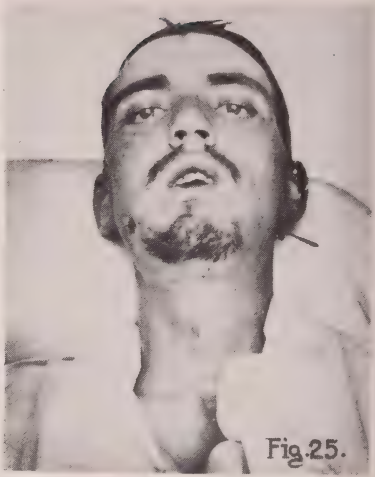


Fig. 25.

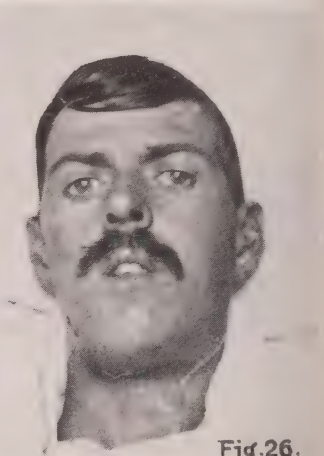


Fig. 26.

Fig. 24A, B. A serious but lucky wound. The bullet entered the face on the left side, passed through the antrum, through the posterior portion of the palate near the lingual surface of the third molar, then through the right tonsil and out on the right side of the neck.

Figs. 25 and 26. Identical wounds, on different men, one caused by rifle bullet, the other by shrapnel. In the case of Fig. 25, a tracheotomy was necessary, due to the edema of the tongue.

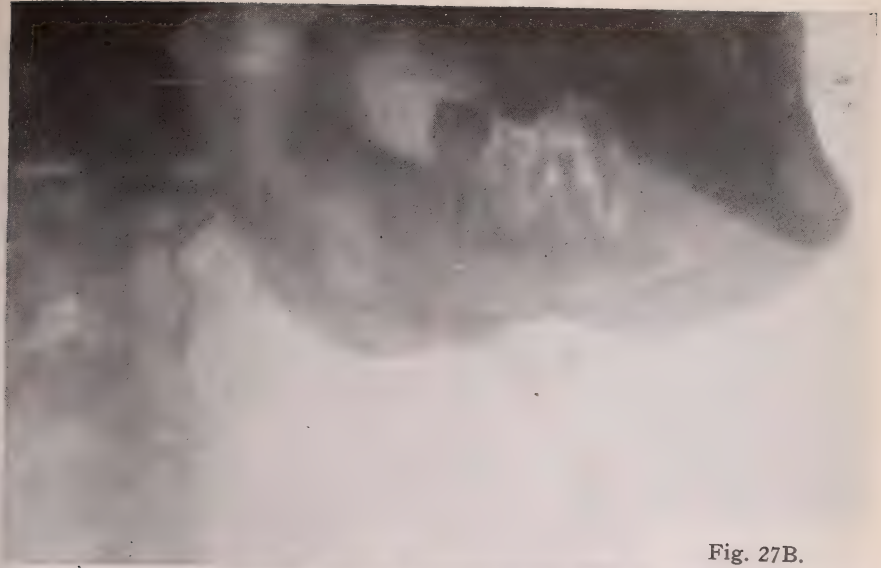


Fig. 27B.

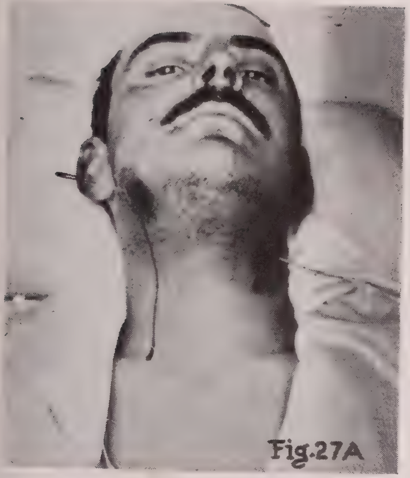


Fig.27A

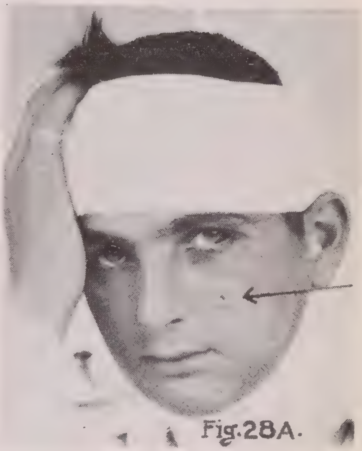


Fig.28A.

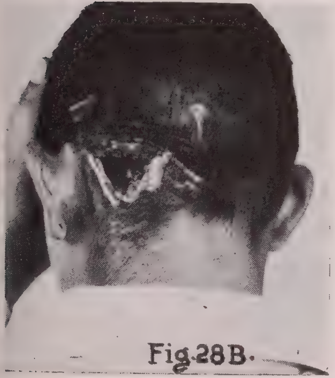


Fig.28B.

Fig. 27A. Wound by a rifle bullet at long range.

Fig. 27B. X-Ray showing portion of mandible nipped off.

Fig. 28A, B. Another lucky shot. Bullet entered right face below the eye and left in the left mastoid region.

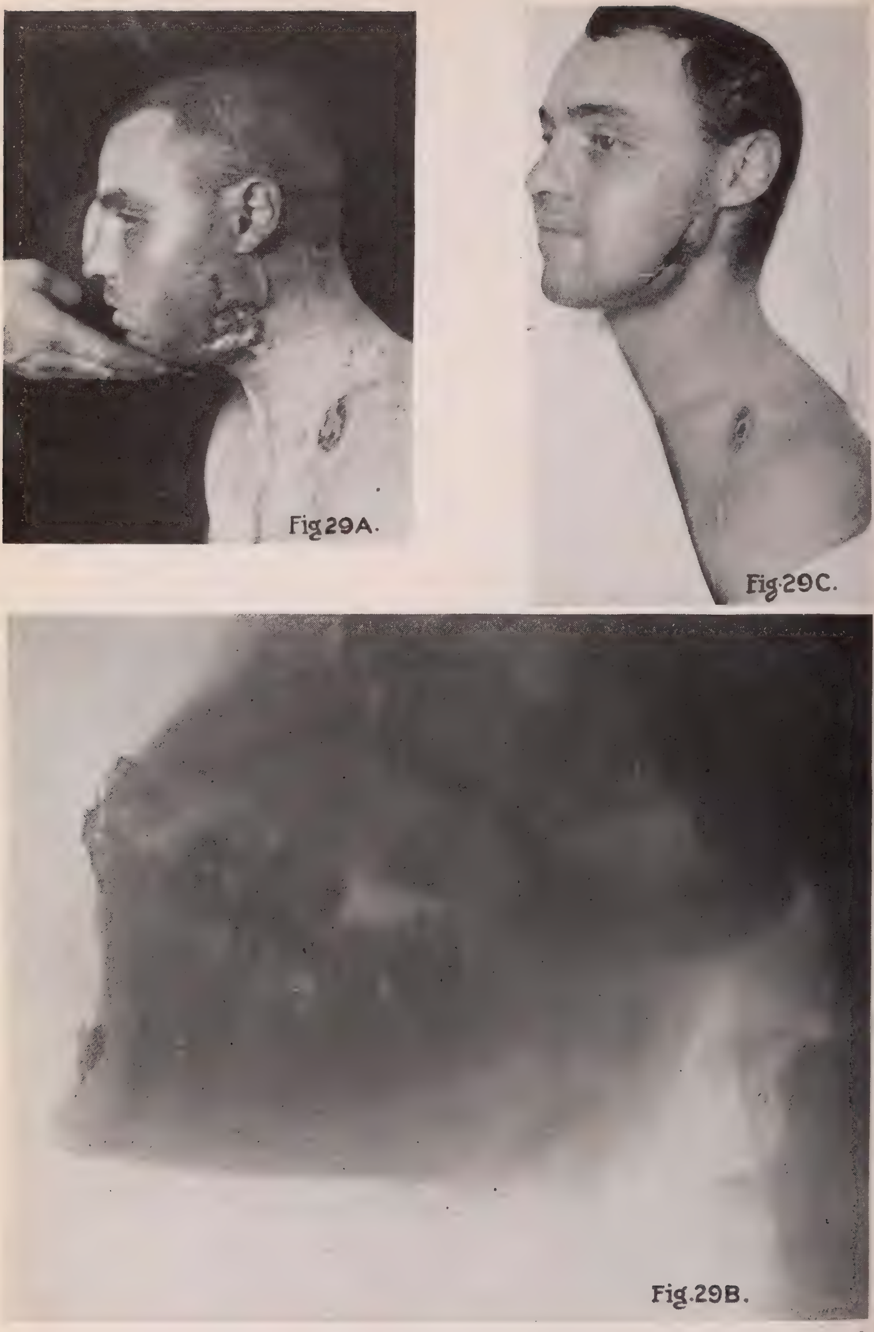


Fig. 29A, B, C. Rifle bullet entered under arm, severed brachial plexis nerve, fractured clavicle and the mandible at the angle nerve sutured by Dr. Neff.

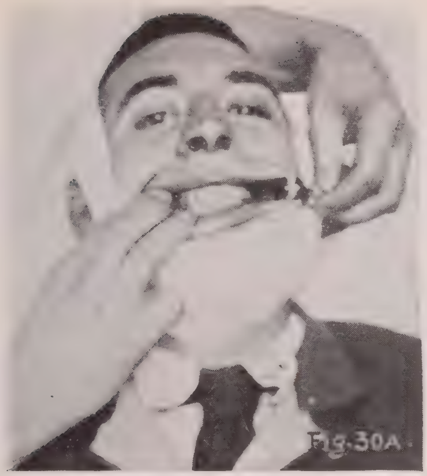


Fig. 30A.

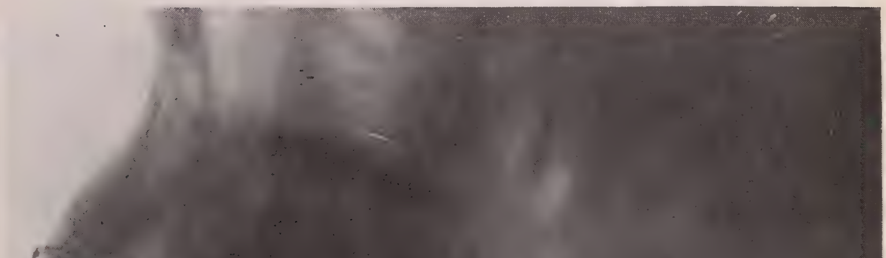


Fig. 30B.

Fig. 30A. The only simple fracture Dr. Meyer met with.
Fig. 30B. X-Ray showing Thomas L. Gilmer method of wiring.

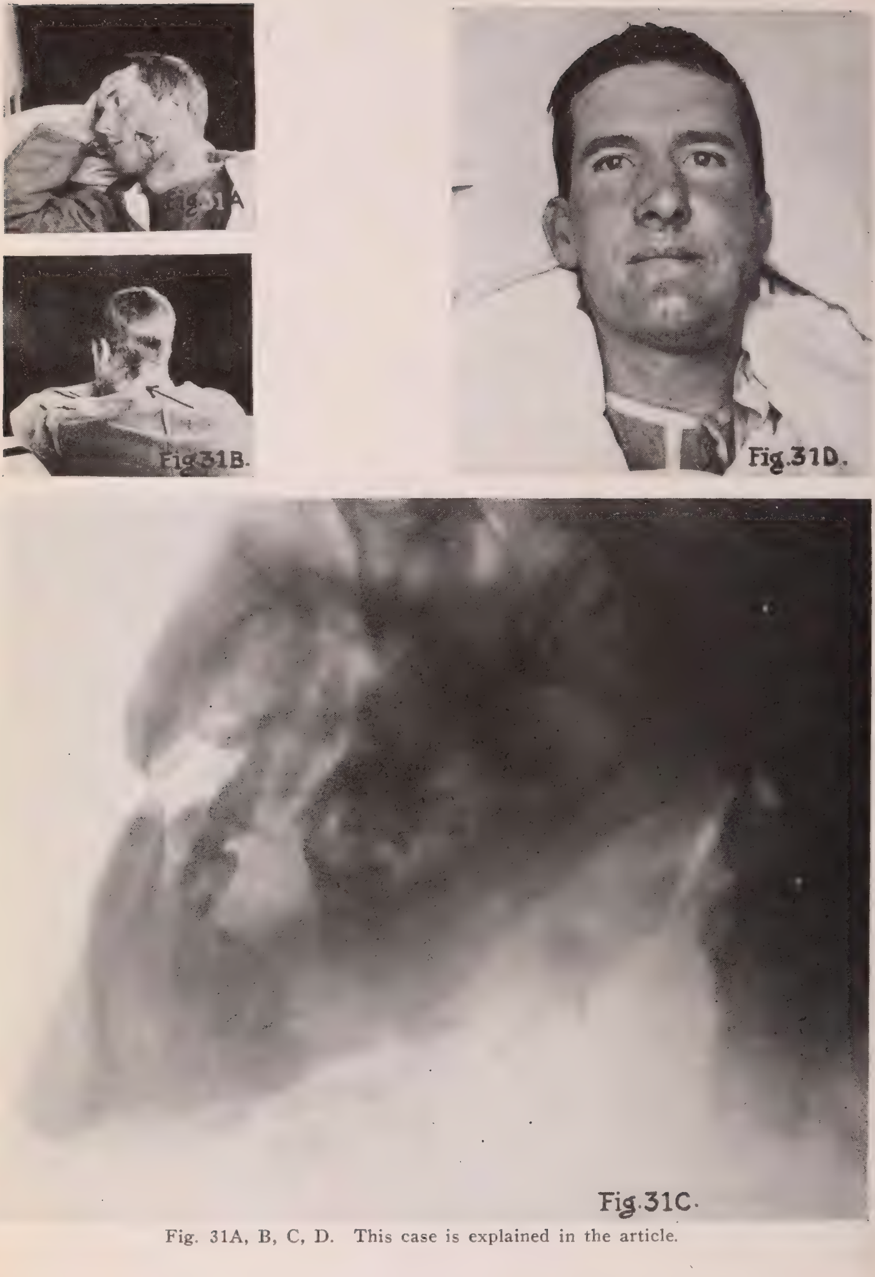


Fig. 31A, B, C, D. This case is explained in the article.

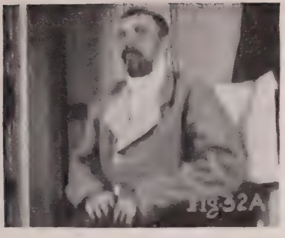


Fig.32A

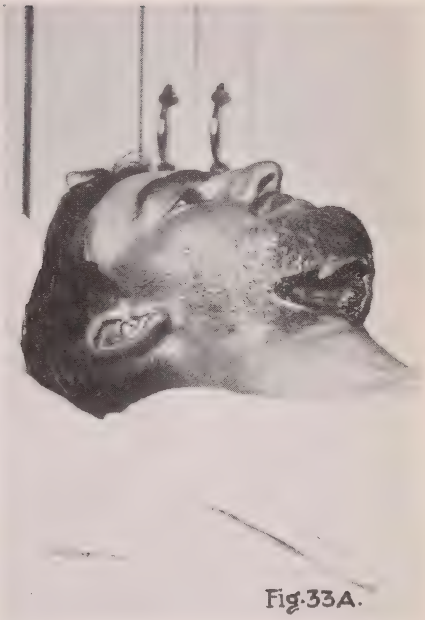


Fig.33A.

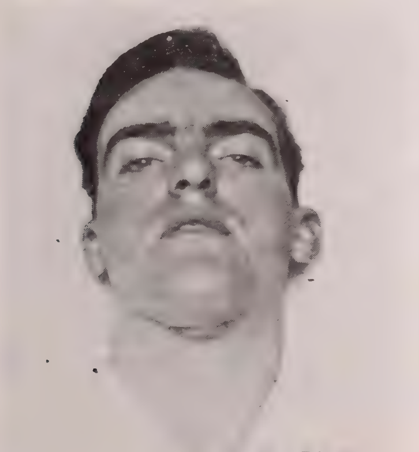


Fig.33D.

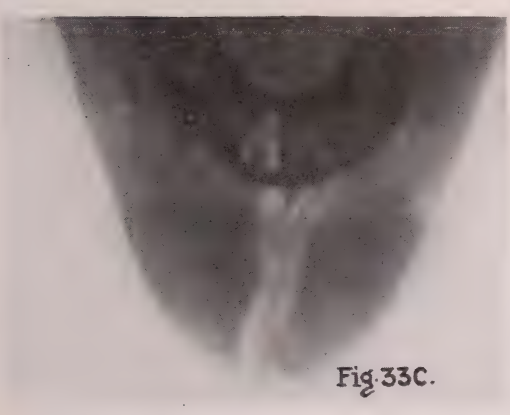


Fig.33C.

Fig. 32A. Compound fracture of the mandible, a secondary hemorrhage developed, which nearly proved fatal.

Fig. 33A, C, D. A wound from a rifle bullet at close range. Bullet exploded on striking, causing compound fracture of mandible. X-Ray shows splint in position. Last picture is patient four months later.

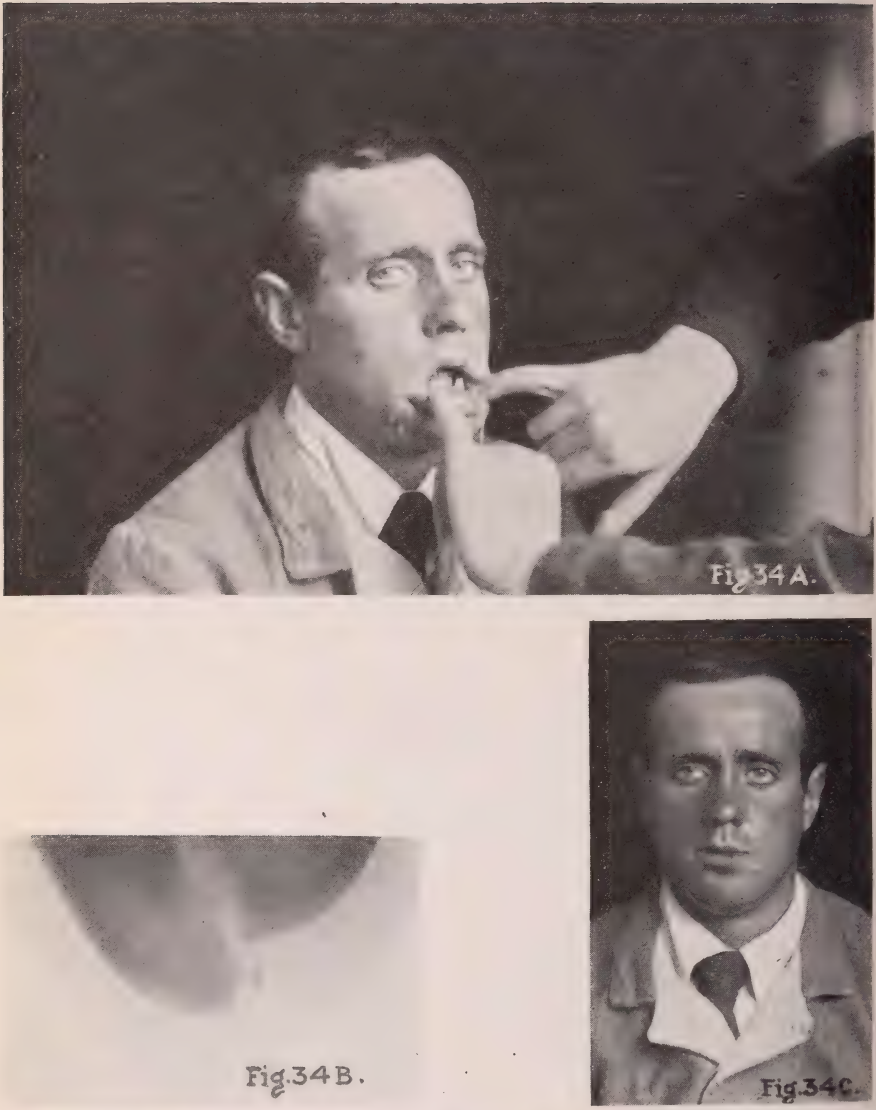


Fig. 34A, B, C. Compound fracture of mandible due to blowing up of a dugout. The method of wiring is explained in the text.

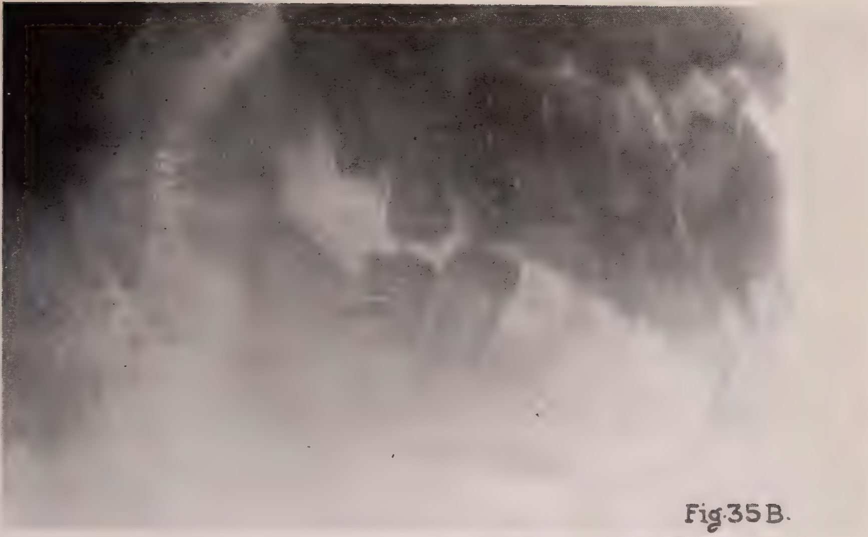


Fig. 35 B.

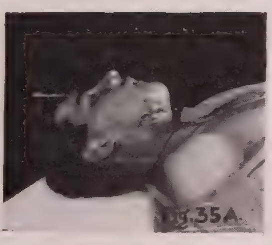


Fig. 35 A.

Fig. 35A, B, C. D. A compound fracture of mandible, consisting of five complete fractures.

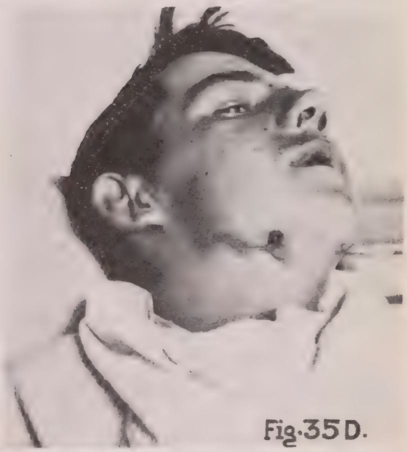
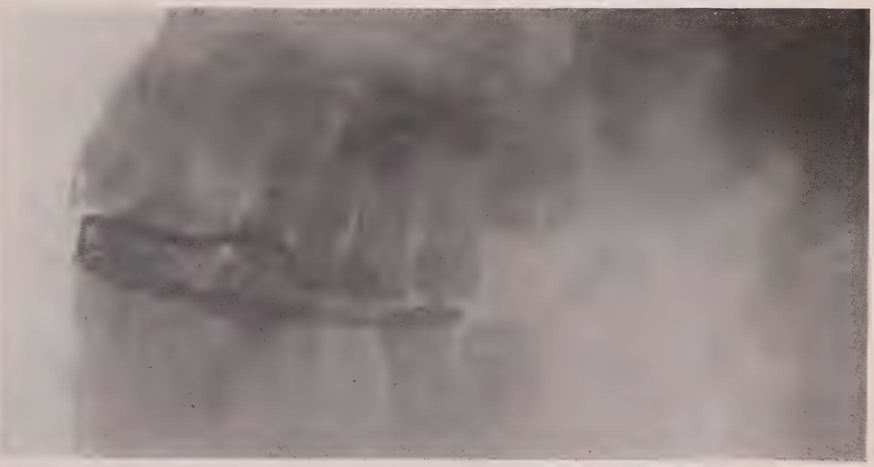


Fig. 35 D.



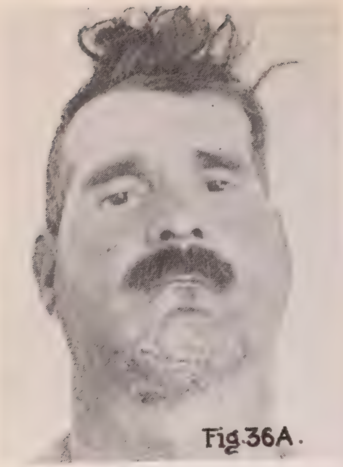


Fig.36A.

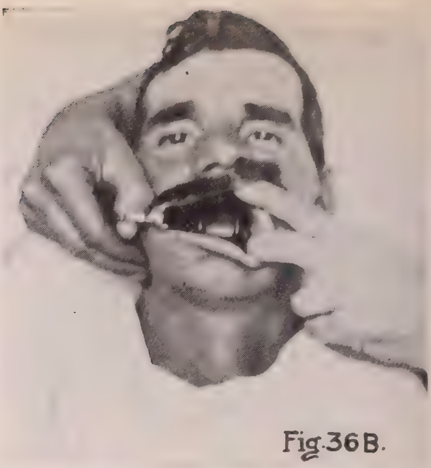


Fig.36B.

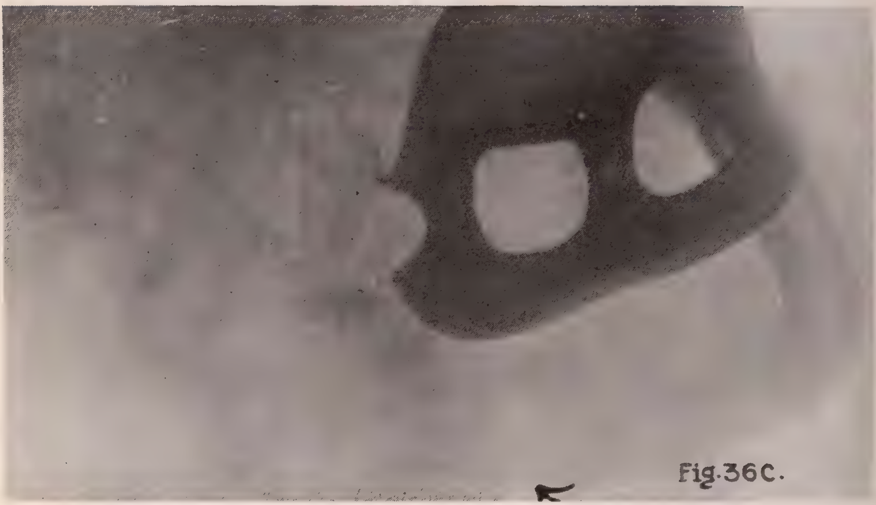


Fig.36C.

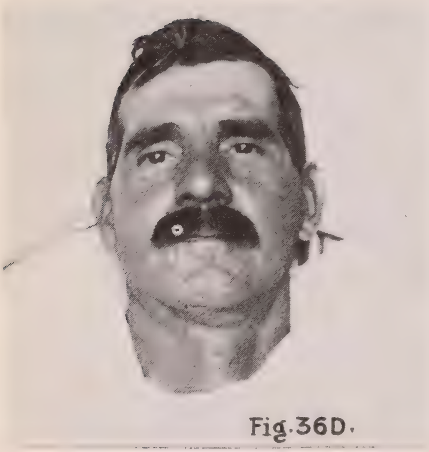


Fig.36D.

Fig. 36A. This British teamster was kicked by a horse of German sympathies.

Fig. 36B, C show splint in position.

Last picture is of patient four weeks later.

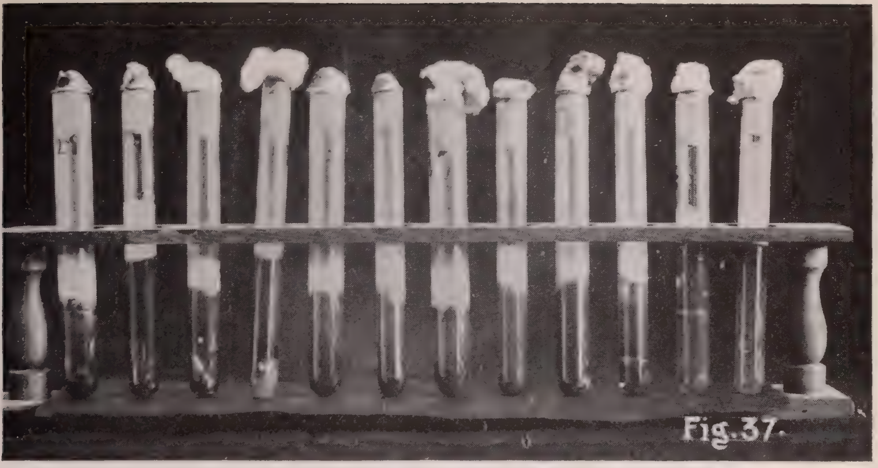


Fig. 37.

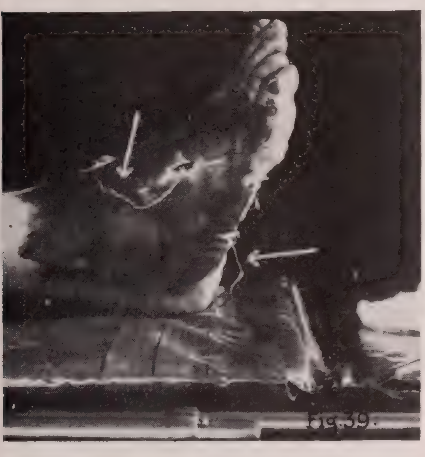


Fig. 39.

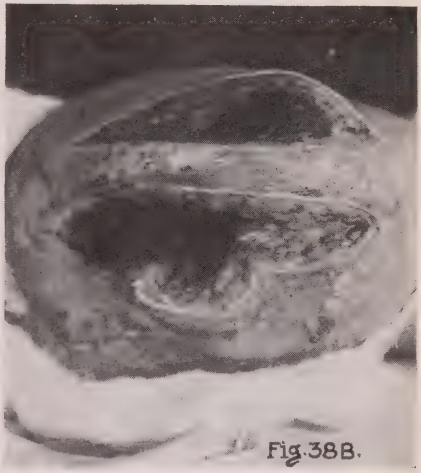


Fig. 38B.

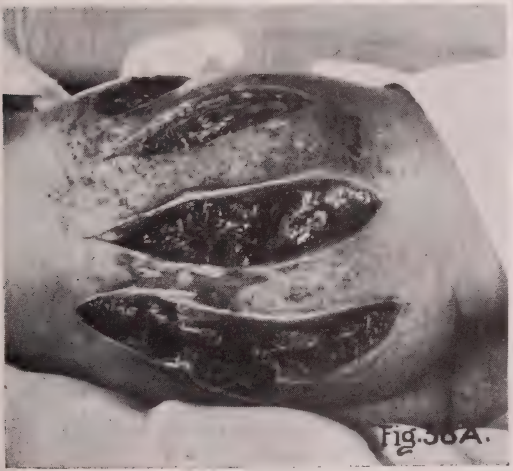


Fig. 38A.

Fig. 37. Test for gas bacilli on shrapnel fragments.

Figs. 38 A and B. Cases of gas gangrene under Dr. Leighton. Surgeons make multiple incisions to give air access to wounds.

Fig. 39. Guinea worms dissected from foot by Dr. Davis.

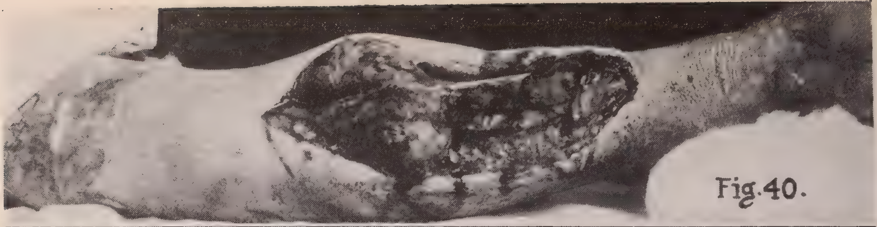


Fig.40.

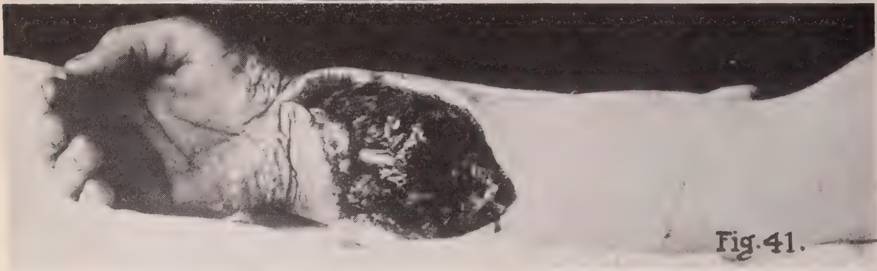


Fig.41.

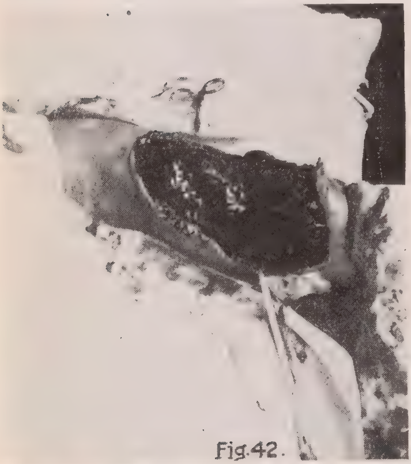


Fig.42.

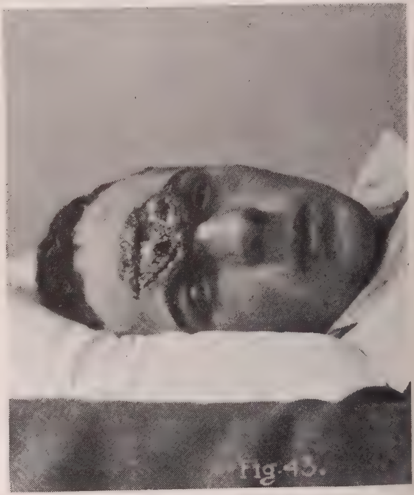


Fig.43.

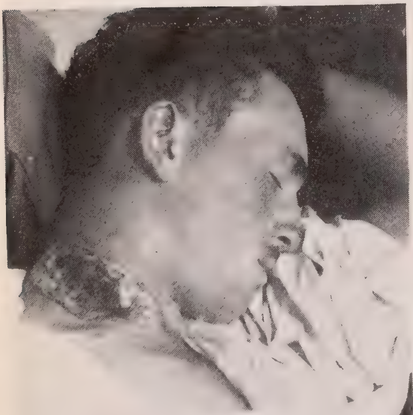


Fig.44.

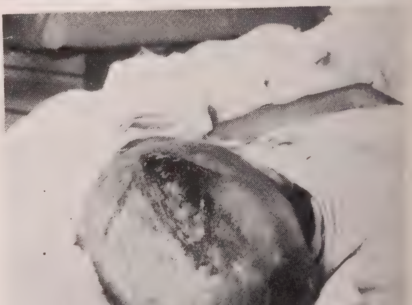


Fig.45.

Figs. 40, 41, 42. Wounds caused by rifle bullets at short range. A bullet explodes on striking, usually because it gets turned around during its flight or else is reversed in the cartridge by the soldier before he fires it.

Fig. 43. Small shrapnel wound of forehead.

Fig. 44. Small shrapnel wound of neck.

Fig. 45. A small bullet wound of the head showing resulting hernia. It is surprising how many patients are living who have several pieces of shrapnel in the head.

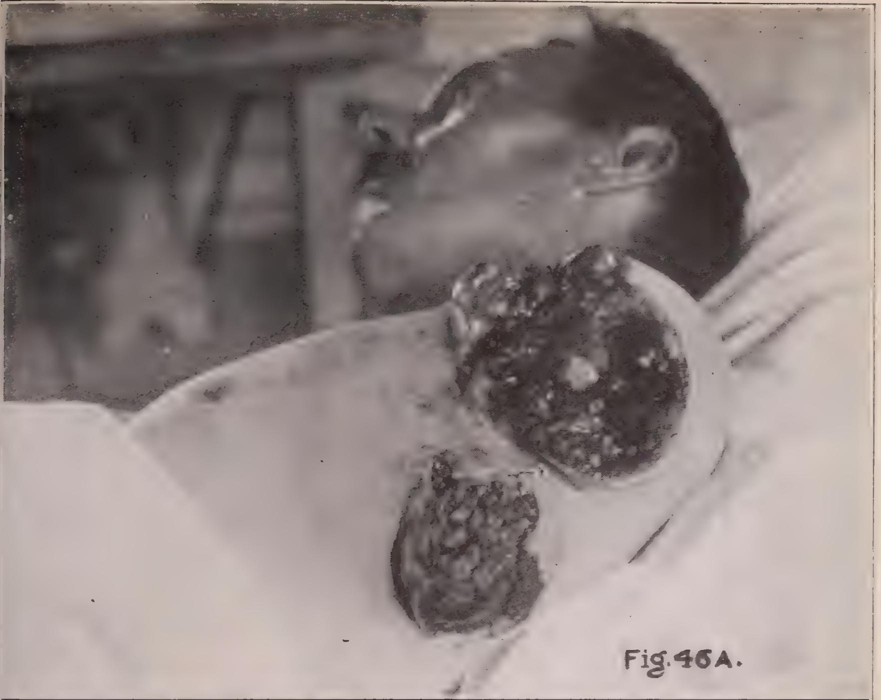


Fig. 46A.

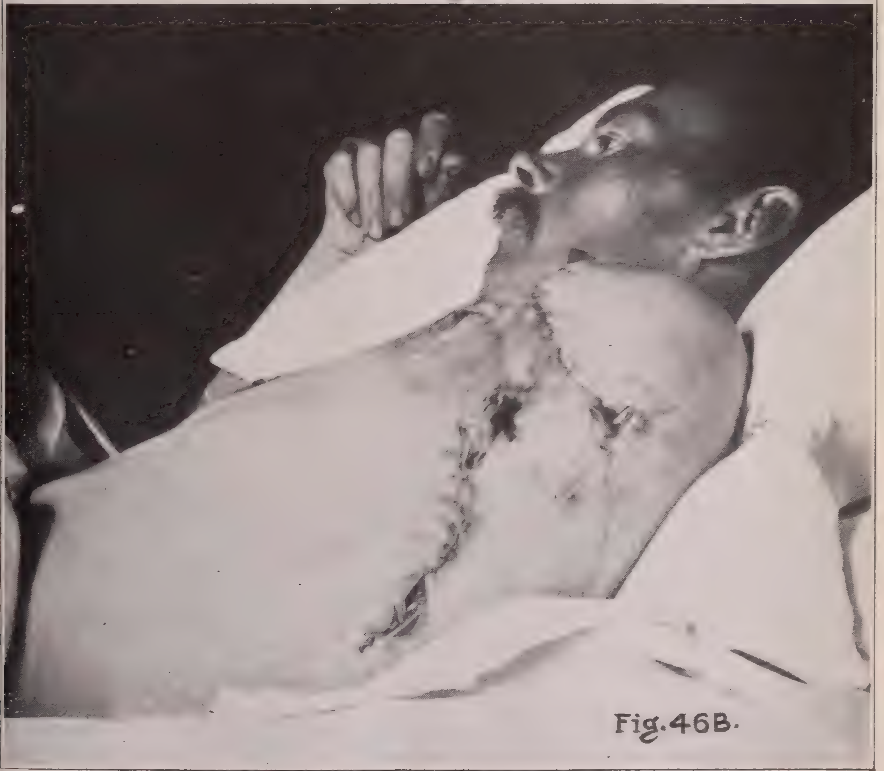


Fig. 46B.

Fig. 46A. Shrapnel wound under service of Drs. Davis and Rainey.
Fig. 46B. Same patient four weeks later.

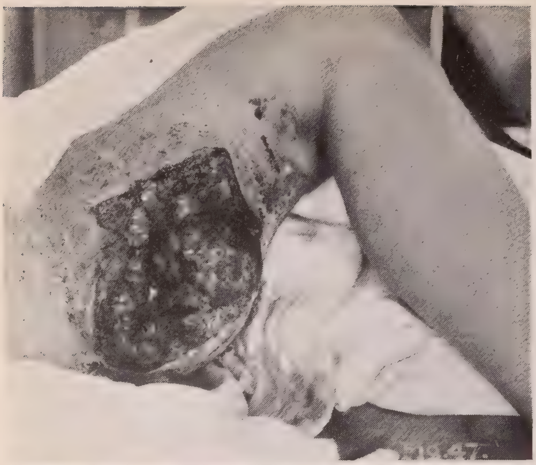


Fig. 47.

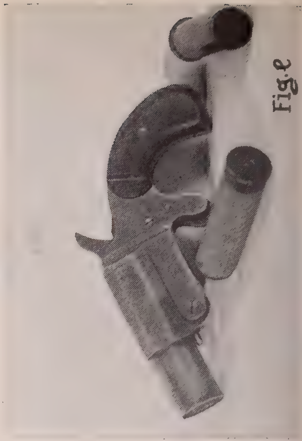


Fig. e

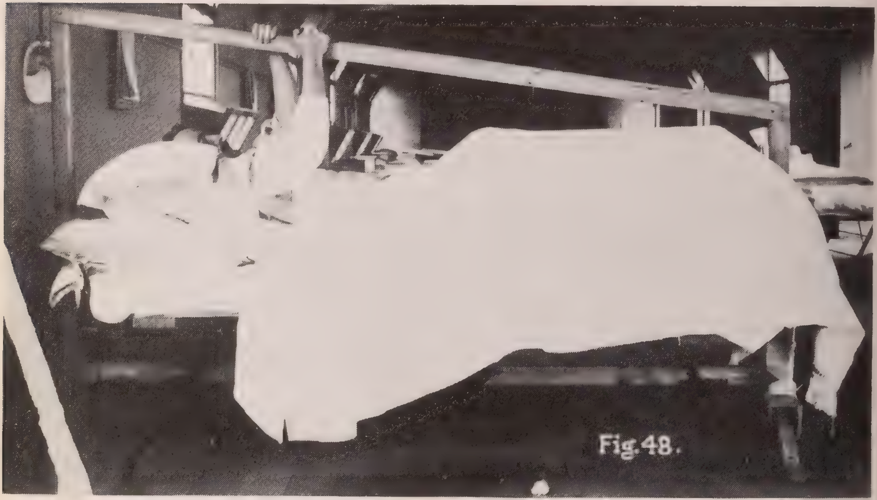


Fig. 48.

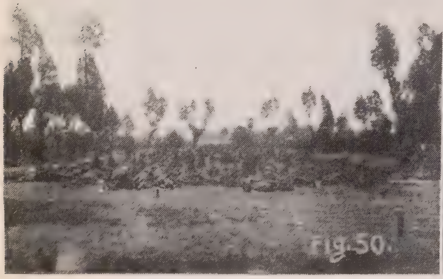


Fig. 50.

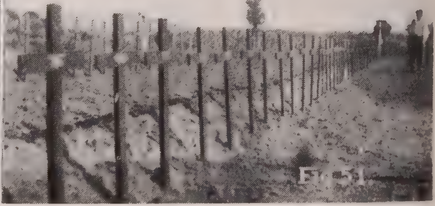


Fig. 51.

Fig. 47. The casing fragment which produced this buttock wound was probably not larger than two fingers. Dr. Rainey's case.

Fig. 48. A chest wound patient. Relatively few chest or abdominal cases reach the base hospitals. The patient usually dies quickly from severe infection.

Fig. e. Pistol taken from dead German officer, used to fire up star shells either for illuminating the enemy trenches, or for signaling. The cartridges contain rockets of several different colors.

Fig. 50. After the battle of Loos. Awaiting burial.

Fig. 51. After burial.

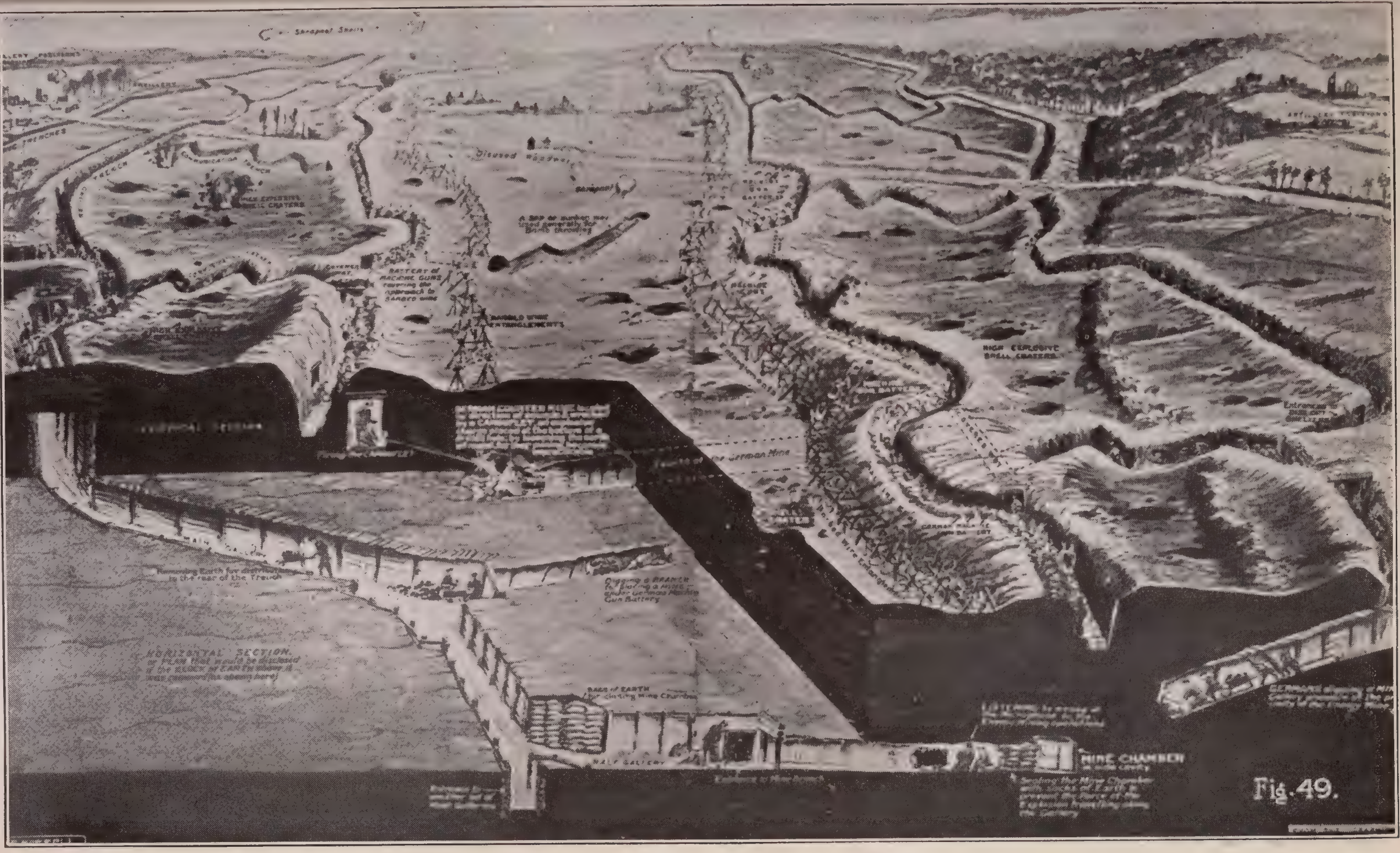

Shrapnel Shells
TRENCHES
COMMUNICATION TRENCH
HIGH EXPLOSIVE SHELL CRATERS
Disused
Sniper
BATTERY of MACHINE GUNS covering the approach to barbed wire
BARBED WIRE ENTANGLEMENTS
HIGH EXPLOSIVE SHELL CRATERS
German Mine
Barbed Wire Entanglements
Entrance
Removing Earth for disposal to the rear of the Trench
Digging a BRANCH for placing a mine under German Machine Gun Battery
HORIZONTAL SECTION
BAGS of EARTH for closing Mine Chamber
HALF GALLERY
MINE CHAMBER

Fig. 49.

Schematic diagram of British and German trench systems.

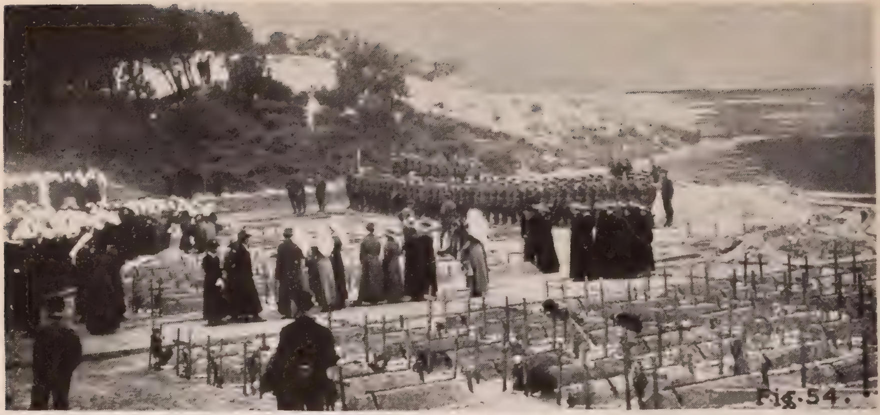


Fig. 54.

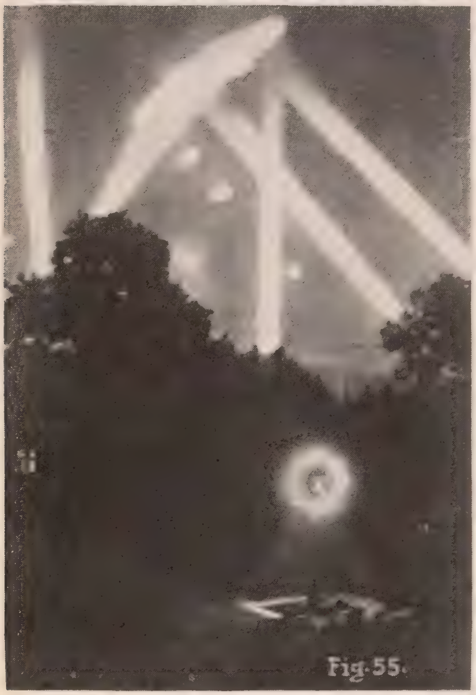


Fig. 55.

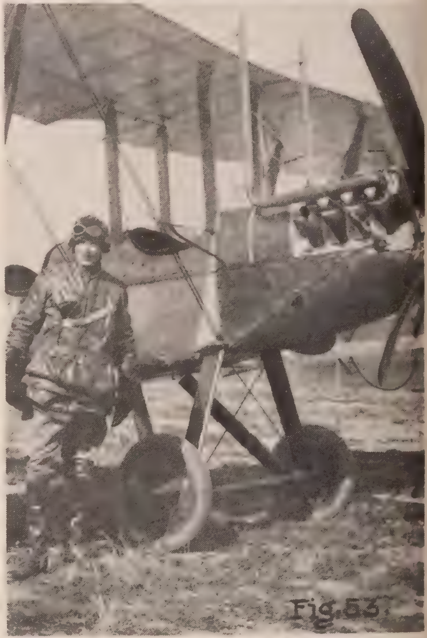


Fig. 53.

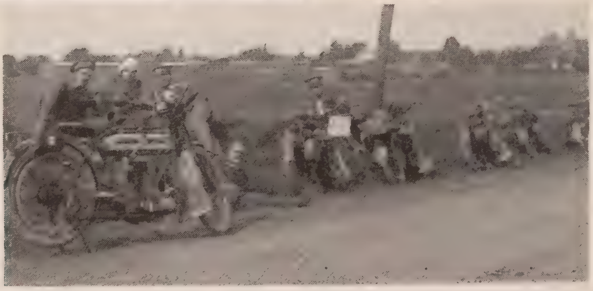


Fig. 52. Squad of motor messengers.
Fig. 53. An air pilot.
Fig. 54. Funeral of Miss Hamilton, one of the nurses of the Chicago Unit.
Fig. 55. The Zeppelin raid which Mrs. Meyer witnessed in London in August, 1915. (Taken by a professional photographer.

Two of our surgeons ranked as lieutenant colonels, six as majors, in charge of departments, and the remainder as captains and lieutenants. In command of our unit was Colonel Charles E. Harrison of the Royal Horse Guards. We were under the same military rules and regulations as governed the regular British officers, with salaries and allowances according to rank. At mess we would drink to the king's health, after the custom of centuries—but this was always followed by a toast to President Wilson.

Our unit crossed the Atlantic on the Holland-American liner Nieuw Amsterdam. During the first part of the trip, pleasant weather made it hard to anticipate the approaching danger, but when it became real the weather was not so favorable. Then we drifted for twelve hours in the submarine zone in a heavy fog, our neutral flag illuminated and the name of the ship in large electric letters along the sides, the life boats swung out and every passenger assigned to a particular boat, and that awful fog horn blowing and sounding like torpedoes bumping into us from all sides. After disembarking at Falmouth, we went by rail to London.

One of the most enjoyable evenings we spent while in London was at a grand banquet given us by the officers of the Royal Army Medical Corps at their club. At this banquet were thirty-two doctors who had just returned the day before from Germany, where they had been held prisoners since the retreat of the Marne. They had been exchanged for thirty-two German doctors captured by the British. Many were the interesting experiences told that night. The doctor at my right had had a leg nearly torn off by a piece of shrapnel while mounting a horse. He was captured a few hours later and his leg amputated by a German surgeon. Before the war he had been the champion heavy-weight boxer of the British army and navy, Capt. M. P. Leahy, R. A. M. C.

While we were in London waiting for our uniforms and equipment, all but Drs. Neff, Davis, Leighton, Chancellor and myself, chiefs of departments, were assigned for duty to military hospitals to study the treatment of the wounded. There were no oral surgery hospitals in the British army at that time, so I occupied myself in studying the conditions and needs of dentistry among the troops in London.

Dr. Leighton and I visited several of the military hospitals in

London. At one hospital, we reported at the operating room and sent in our cards. After waiting for some time, we were ushered into the operating room. Here we stood about twenty minutes without being welcomed or spoken to. Finally the operator, one of Sir Lane's associates, raised his head, sized us up, and then pounced upon us to inquire about some literature which he had sent a few years previous to a doctor in San Francisco, and which he had never heard of being published.

He continued to converse with us while he proceeded with his work, amputating arms and legs, removing frost bitten toes, etc. Two assistants were giving anesthetics while he went from one operating table to the other. He was indeed a skillful operator. Finally Dr. Leighton asked him what was being done along the lines of oral surgery for fractured mandibles. He replied that they were doing practically nothing for such cases, and that he knew of no oral surgery being practiced at that time in the British army. I learned later that the French government had already established military hospitals for oral surgery at that time.

Before we left, Dr. Richardson, who had been assigned to this hospital, called our attention to a patient whose mandible was fractured and partly shot away. He had been given a seven days' leave and was being sent back to the front with that wabbling jaw.

The British War Office ordered our unit to the Dardanelles, but we strongly objected; so finally, after receiving our equipment, we were started across the channel for France. Time will not permit me to show you pictures of the scenes across the channel from Folkstone to Boulogne; how nets are strung all across, with mines intermingled; how the boats zigzag through these mines; how the troop ships are convoyed by torpedo boats; and how, after a high sea, some of these mines break loose, and the mine sweepers and patrol boats are ordered out to shoot up the mines. It is remarkable that dozens and dozens of boats have carried troops to and from France every week since the beginning of the war, yet not a single one has been sunk by submarine, while just one hospital ship has been sent down by a mine of unknown origin. (See Fig. 2.) It seems that the German submarines are able to sneak in strings of mines occasionally, a source of continual annoyance.

We were met at Boulogne by the British Medical Staff. Quite ignorant of our destination, we were carried across the dusty hills in military cars at forty miles an hour. We passed several large camps, where stops were made for the inspection of the motor passes, and then we would plow on through the dust. Finally, after climbing a big hill, a doctor sitting in front exclaimed, "Look there," and to our surprise, at the foot of the hill, and protected on all sides by high slopes, was a beautiful city of hospitals. After unloading our meagre baggage here, we were ordered back into the machines and were taken about three miles further to a small town, where we met the colonels in command of these hospitals, together with their staffs. To our delight, a splendid feed was awaiting us. At this dinner, the general in command expressed his joy at having the American surgeons come over to aid the British, and ended by saying that he supposed the British would have to suffer. (Laughter.)

The hospital to which we were assigned was some thirty-five miles back of the first line trenches. Up to a month before our arrival, this region was nothing but sand hills; but now, throughout those hills, there are about sixty hospitals, each with a capacity of from 1,040 to 2,000 beds and each fully equipped with two operating rooms, electric lights, steam heat and large sterilizing huts for cleansing the clothing, blankets, etc., that come in on the wounded "Tommies."

The British surgeons who had been in charge of our hospital did not enjoy being routed out by a lot of Americans, so we were "in bad" at first. In fact, all the British surgeons except the generals and consultants were rather cool for the first month. However, a few days before the battle of Loos, we received orders to evacuate the hospital of patients at once and to increase the capacity to 1,570 beds. All this was done in twenty-four hours. Throughout the battle we cared for several thousand more patients than did the British hospitals, with the exception of No. 1 Canadian. As a result, this hospital and ours were the only ones to receive honorable mention for that battle. Then the temperature rose, and representatives were sent to us to learn how such work was accomplished. Things had been so systematized by Dr. P. S. Chancellor and by Capt. Irvine Fortesque, R. A. M. C., Adjutant of the 23rd General Hospital, that every one of the hundred and fifty orderlies, every nurse, and every surgeon had a certain duty to perform at a certain time. Hence our success.

Our hospital contained four "T" wards connected directly with the two operating rooms, and thirty-five other wards, which stood by themselves and occupied about two large city blocks. All serious cases were kept in the "T" wards. The hospital was divided into a surgical and a medical section. The surgical part was subdivided into three "services." No. 1 Service was commanded by Dr. Neff, lieut.-col., assisted by Dr. G. Gill, major, and six other surgeons with ranks of captain or lieutenant. Similarly, No. 2 Service was headed by Lieut.-Col. G. Davis, assisted by Maj. W. R. Rainey, while the third service was in charge of Maj. W. E. Leighton, with Maj. W. Richardson as assistant. In addition, there was the ear, nose and throat ward, under Capt. J. R. Taylor, and the eye ward commanded by Capt. C. Maghy. This ward was always pitifully full of patients, some with eyes shot out, others whose eyes had been removed at the clearing station, and still others waiting their turn.

The medical section, under Dr. Chancellor, major, with several assistants, was divided into a general, a V. D., and a neurological ward. In the latter was always a great number of men who had gone insane from the awful strain in the front line trenches. All contagious cases were sent to the isolation hospital. The cases were separated as far as possible for the different services at the receiving hut, when they were being unloaded from the ambulance trains. If the medical cases later became surgical, they were transferred.

All the British hospitals in France are run on a similar administrative plan. At the head of each hospital is a colonel, usually one who had been retired and who was recalled to active duty since the beginning of the war. The nurses, or sisters, as they are called in England, are under the direct charge of the matron; in fact, the matron of a British hospital has as much authority as the colonel and chief surgeon and usually a little bit more. Our matron, Miss Isabel M. Patton, was awarded the Royal Red Cross for the skill displayed by her and her nurses and orderlies during the battle of Loos.

At the foot of our hospital was a convoy station, to which the ambulance trains brought in wounded from all along the firing line. The railroads are built to reach all parts of the line from this point, so that reinforcements can be rushed to meet any sudden drive of the enemy. The wounded can be brought back to this station in from four to twenty-four hours after they reach the rail head, which is the point nearest the firing line to which the trains can safely venture. It is usually five or more miles back. The wounded are carried on stretchers from the firing line to the rail head, either through communicating trenches, or else, at night, above ground. At some points, where hills offer protection, the latter part of this journey to the rail head is made in motor ambulances. In any case, the wounded have to be carried at least a mile through trenches plentifully filled with mud and bloody water. Thus it may take a few hours, or it may require four days, for a wounded man to reach a base hospital from the trenches. On the way, his wounds may have been dressed as many as four times, but very frequently the patient reached our hospital with only first aid dressing.

The British have more than twenty-four ambulance trains, each beautifully equipped with all the accessories of a first-class hospital. Each train has a chief surgeon with one or two assistants, a matron, her nursing staff, and orderlies. The head surgeon of one of these trains told me that they very seldom operate en route because of lack of time and the severity of the cases. The Germans got range of a rail head one day, and, with one of their big shells, completely demolished a hospital train loaded with wounded and just ready to start.

During periods of severe fighting, all patients brought to a base hospital, except those requiring immediate operations, and those who cannot be safely moved, are entrained for England within six hours. First, however, they are bathed, given clean linen, and their wounds are dressed. At times of little heavy fighting those patients are also retained at the base hospital who can be fitted for the convalescent camp within three weeks.

We had been at the hospital a week when we received notice towards eleven o'clock at night that a convoy of about three hundred wounded was coming in. Immediately the motor ambulances were sent to the convoy station in readiness. Half of the orderlies were detailed to the convoy station to help unload the wounded; the other half remained at the receiving hut to carry the wounded from the motor cars to the wards. We surgeons seated ourselves along either wall of the receiving hut. As the stretchers were brought in each was set down long enough for one of us to get the name, regiment and number of the patient and the location of the wound. If the patient could not talk we simply took his number from the metal tag which they all wear around the neck. The information obtained was written on a tag (Fig. 5) and attached to the patient, who was then carried to his ward. After all the patients had been received, the surgeons retired to their wards and started the dressings. In the meantime, the nurses and orderlies were busy removing clothing and bathing the wounded.

I shall never forget the sights I saw that night. The men were simply cut and torn to pieces and were so caked in mud and blood that in most cases it was difficult to remove the clothing. You might imagine that in such a convoy you would hear all kinds of moans and cries of anguish, but really there was scarcely a murmur. These men had been confined under a most awful strain in bloody trenches, with little sleep and with the air filled with flying iron. As one Tommy put it, "With the Boches shootin' at you from all sides, dropping bombs on you from the air, trying to blow you up by mining under you, with the rats and body lice busy at all hours, and the rain drowning you out, it's H—eaven." Consequently, when Tommy is wounded, carried back to safety, and put into a clean bed, he just relaxes, forgets his wounds, and even goes to sleep while he is being dressed.

The first two patients I saw dressed in the operating room made a terrible impression on me; I lost several nights sleep thinking about them. One of these men, a splendid-looking fellow, six feet two in height, was from one of the finest regiments in the British army. I want to say, before I forget it, that there is none of the original army left. The flower of the British and French armies, and of the German army, too, I am told, is simply wiped out. A colonel, whose regiment had been on the firing line during the battle of Loos, came to our hospital to look up the remainder of his men. He told me with tears in his eyes that he was able to find but thirteen of his regiment. He was the only surviving officer. One of his men lay there with only a few hours to live. This colonel offered to do errands for him, write letters, or do anything to make his last hours more peaceful and quiet.

But to return to the patient I started to tell you about: We first dressed a severe wound on his foot, which was almost severed from the leg. Then we dressed a second and a third wound; we turned him over on his back and found that his buttocks were practically all torn away by a piece of shrapnel. The next day, after he passed away, we counted some sixty wounds, large and small. He was peppered on all sides, but his head and neck had not been touched.

I speak from experience in saying that there is nothing so nasty as shrapnel. As a member of Company C, 9th U. S. Infantry, I was in the battles of Tientsin and Pekin during the Boxer uprising, where the shells were bursting all round us. Later, in the Philippines, I was one of the three survivors of the massacre of Balangiga, where we fought with nothing but bayonets and knives. Though people shudder at the horror of bayonet charges —as described in the newspapers—I want to say that, of the two evils, I would rather meet an army with bayonets than face that horrible mess of shrapnel. (See Fig. 6.) Shrapnel wounds are extremely septic, the clothing being driven into the body and the patient becoming simply swamped in pus. A bayonet, on the other hand, either kills you at once, or leaves you with some chance of recovery.

At first, every specialty but mine had a place in the hospital, and I had a hard time getting a start. I had no particular place in which to work, no help and no equipment except the instruments and supplies that I had taken with me, while all the other departments were fully equipped. Many cases that really belonged to me came into the hospital, but the external wounds were bandaged up and the patients were sent on to England the next day. Very little could be done for a fractured mandible over night.

Very few of the men had sound teeth, and even if a patient did have a few teeth before entering the trenches, they were usually shot out if the wound was in the jaw. Even where conditions were favorable, wiring could not be done, because the patient could not cross the rough channel with his jaws wired closed.

Helping dress all kinds of wounds, and assisting in the operating rooms or in any other place where I could make myself useful, did not come up to my ambition of being a war surgeon. I wanted an opportunity to render my services where they would be the most valuable. There were hundreds of cases of fractured and mutilated mandibles that needed the aid of an oral surgeon; but first it was necessary to convince the surgeons of the desirable results obtainable by thorough irrigation and drainage, together with the mechanical skill of the dentist in constructing and placing the various kinds of splints and appliances necessary for holding the broken fragments in normal position.

In order to get my "place in the sun," I started out to the surrounding camps and hospitals, extracting teeth and placing an occasional temporary filling. I owe my reputation to novocain. The officers and Tommies thought it quite a treat to have a tooth extracted, with novocain as an anesthetic, after being hauled around in the trenches by a surgeon, who unwillingly, has to do the extracting there.

At one camp where I called—you may think this a large number, but it is true—over five hundred soldiers out of a total of ten thousand, were lined up for extractions, while very seldom in any of the camps were there less than a hundred waiting. I would work from early in the morning until late at night, and as you realize, would be unable to treat more than one hundred patients. They could not understand why it was impossible to attend them all.

I found several fractured and mutilated jaws and faces in these hospitals, and, after doing my duty as extractor, I was successful in most hospitals in inducing the colonel in command to hold these patients over long enough to allow me to place some kind of splint. In this way, I managed to carry several cases to the point where the surgeons in these hospitals were convinced that the jaw cases should be treated mechanically as well as surgically. Through my work in the field and other hospitals, I was called to the Duchess of Westminster's hospital, where I treated three cases of fractured mandibles. In the meantime I succeeded in getting a few cases in our own hospital, but most of the cases were being sent over to England. Finally, the Duchess of Westminster and Colonel Carr, A. D. M. S., called on me in regard to an important case at the Westminster hospital. On leaving, they asked me whether there was anything I wanted. There was plenty. (Laughter.)

Thereafter the handicaps of poor quarters and insufficient supplies were removed. They transformed a part of the hospital, a large part, into an oral surgery department. They gave me a special operating room, special wards and dressing rooms, and special nurses. (See Figs. 9, 11 and 12.) I was no longer obliged to run from one ward to another throughout the hospital, wherever I happened to find a case, carrying my things with me and waiting while the surgeons took up all the available time on limb wounds. With special nurses, orderlies and mechanics I could maintain efficient service. After this I got everything I asked for. There was nothing in the British War Office that they would not send over.

At this time Colonel Carr put me in command of the Oral Surgery Department. The fractured jaw cases were allowed to remain in the hospital until we saw fit to remove them. All such cases from about eighteen hospitals or 20,000 beds were sent to our department of the 23rd General Hospital. They also permitted me to select consulting surgeons, because many of the patients had limb and chest wounds as well as jaw wounds. Drs. Rainey and Hilton were associated with me in this work. We had free access to the bacteriological and X-ray laboratories, and, most wonderful of all, I was allowed to use a camera. Under these conditions we were able to accomplish something, and the real work began.

I want to say here that I would have been practically helpless if it had not been for the extremely efficient services of my head nurse, Miss McEdwards. After being on duty all day, Miss McEdwards worked many a long night on critical cases. She spent practically every cent she earned in buying her patients extras, anything they wanted. I am glad to say that this nurse is in the audience this evening. (Prolonged applause.)

Ours was the first hospital exclusively for oral surgery in the British army. In fact, at the time of our arrival there were only about six dentists for the million British troops on the continent. Each of the Canadian units had a dentist with the rank of captain, but they were doing only extractions and stoppings. They had no vulcanizer, so they could make no splints. After our oral surgery department was organized, their fractured jaw cases were sent to us.

The soldiers' teeth are few and miserable. Volunteers are enlisted, teeth or no teeth. After a year of neglect in the trenches (men do not use water to clean their teeth, when they have not even enough to drink) their dental condition is frightful. The men cannot chew their emergency rations, hardtack, etc., without teeth and yet stay well, especially under the conditions of the trenches. Hence thousands and thousands of men, fully fifteen percent of all the hospital cases, are sent back by the medical officers at the front because they have indigestion, gastritis, pyorrhea, caries, broken plates or fractured jaws. You can hardly realize how much it costs the government to transport these men back and forth, and how much it hinders the proper treatment of the wounded.

Fully thirty percent of all the cases are sick patients. But it is hard to tell whether a man is really sick or not. The soldiers have all kinds of excuses to get back from the trenches, and after what I saw, I do not blame them. If one man can work a scheme, some pain in a certain region, there are soon hundreds of them working it. (Laughter.)

This is true of both the British and French armies. When visiting l'Ecole Dentaire de Paris, I was told: "We no longer vulcanize any of the plates on models because some of the men on reaching the trenches purposely break their plates and have to be sent back for other dentures. So now we wax them up on the model and vulcanize them off the models. We file the model away together with the bite, and, if a man breaks his plate, his number is sent back, and we make him a new plate. In many cases, by the time it can reach him he is dead."

At one time there were in the convalescent camp over five hundred men from this one group of hospitals waiting for plates. Previously such cases had been sent to England, but later, to avoid congestion of traffic, Colonel Carr established at the convalescent camp a dental department of five dentists and eight mechanics, who did nothing but extract teeth and make plates.

The dentist placed in command of this infirmary was practicing dentistry in a suburb of London at the beginning of the war. He tried at the War Office to get a commission as a dentist but was told that dentists could not be used in the army. Up to that time there had been no commissioned dentists in the British army, except in the Canadian contingents. His credentials were filed, but he enlisted as a private, taking his forceps with him to the trenches.

Here he served for over a year, building up quite a reputation as an extractor in the meanwhile. Men and officers would come from the trenches for several miles on either side to have teeth extracted. After a year he was given the rank of sergeant, and soon after a staff officer came to investigate him. Four months later he was ordered to report to the A. D. M. S. of Etaples. He went, not knowing whether he was to be given some special duty or was to be shot. To his surprise he was made lieutenant in the Dental Corps. I mention this incident merely to show how the dentists responded to the call to arms, even if it meant serving as privates, and to illustrate how small a rôle the dental profession played at the beginning of this great war.

After the new army began coming into France, Colonel Longhurst, R. A. M. C., Assistant Inspector of Drafts, came to me while collecting information on the dental problem. He told me that Kitchener, in organizing his new army, was so anxious to get men that they were not given dental service but were promised teeth after arrival in France. These men were now being sent back from the trenches by the hundreds, with nothing but dental troubles. There was an army of dentists in England extracting and placing plates, but after the men had spent five or six weeks in the trenches their plates no longer fitted because of absorption. Colonel Longhurst decided that thereafter only roots decayed below the gums were to be extracted, unless there were several septic roots giving immediate trouble. All other roots were to be left for masticating purposes. No man was to receive plates if he had three or more opposing teeth anywhere in his mouth. Any man who broke his plate in the trenches, either purposely or by accident, stayed in the trenches, and his plate was sent to the dental infirmary for repairs. It was returned to him in the trenches—if he had not been killed in the meantime.

Later one dental infirmary was established by the British at Rouen and another at Sainte Mar, each with a staff of ten dentists and twenty mechanics, and with a capacity of about a hundred plates a week in addition to extractions. Another infirmary at Boulogne had five dentists and eight mechanics under the efficient command of Dr. A. C. Valadies, who was also doing oral surgery in the various hospitals of the northern district of the British Army in France. He had no special oral surgery hospital up to the time I left France, but he told me then that one was to be built for him.

When the Harvard Unit came to France, Dr. V. H. Kozansion, lieutenant, and two assistants started another oral surgery hospital at Ameries. For the first six months they were handicapped at being installed in tents, but now they have splendid quarters and are doing wonderful work. When I left, this hospital and the 23rd General Oral Surgery Hospital were the only two hospitals exclusively for oral surgery in the British Army in France. The British now have established the Craydon Military Hospital exclusively for oral surgery in a suburb of London. It is a wonderfully equipped place, with three hundred beds, and splendid work is being done there under Dr. Calier; but with all the army dentists now in France there are enough to make only a very small impression on more than a million troops.

I will now show you a few of our jaw cases, as well as some of the general surgical cases. Time will not permit me to include X-rays of every case or to exhibit the models, but at the close of the meeting I will be glad to show them to anyone interested. Nor will it be possible to give details of treatment in many of the cases. My primary purpose is to give a bird's eye view of the whole situation as I saw it.

Fig. 13 is a view of one of the dressing rooms. The first nurse is Miss McEdwards. The cases which we handled were so septic that during the first few weeks most of them had to be dressed every two or four hours. By the time the nurses finished the last case it was time to begin all over again. We just seemed to swim in pus. No matter how much we cleaned and scrubbed and boiled there was pus everywhere. I cannot begin to picture to you the conditions as they actually existed.

Fig. 14a shows a handsome young officer just before the battle of Loos, and the next photograph shows him three months later. His whole chin had been torn away, including the anterior portion of the mandible back to the second bicuspids. The chin was replaced by a graft. The broken fragments of the mandible were held apart by a mechanical appliance until such time as a bone graft could be successfully placed.

The patient in Fig. 15 was wounded at Neuve Chapelle.

While standing about one hundred and fifty yards from the enemy he was struck by a missile from a trench mortar. He was taken unconscious to the field hospital. He recovered during the day and was sent to our hospital. The missile entered at the base of the nose, splitting it in two. Passing down through the hard palate, it fractured the superior maxillary, split the tongue, and, striking the mandible, fractured it at the symphysis. It passed out and glanced off the chest. Owing to excessive edema of the tongue, a tracheotomy was necessary.

Remember that all these wounds were produced by bullets—the Tommies call them explosive bullets. It shows you what bullets will usually do at close range. All the patients whose pictures I am showing you lived, so do not be too sorry for them. They are all happy. A wound means a vacation.

(Fig. 16a.) This patient was off duty and was lying down in a rear trench when a shell exploded near him. One of the bullets from the shrapnel struck him in the chin, tearing away the base of the chin and the base of the anterior portion of the mandible. It also produced three fractures in the mandible, one on each side in the bicuspid region, and one at the symphysis.

After his wound was dressed by the stretcher bearer, the patient was carried to the first dressing station, two hundred yards back, and from there a mile further to the second dressing station. Here he was inoculated against tetanus and again dressed. After dark he was taken to the clearing hospital, redressed, and then moved by motor ambulance to the rail head. From here he was shipped by ambulance train to a base hospital, where he remained one day, and thence he was sent to our oral surgery hospital. I mention these details to show you what a wounded man must go through in order to get to a base hospital from the firing line, and how pleasant it must be, after standing in the first line trenches all night, to go back a short distance from the German line to snatch a little sleep.

Fig. 16b is an X-ray of this same patient's fractured mandible. He had enough teeth to make it possible, after the fracture was reduced, to swage a German silver plate and cement it on the lower teeth. By looking very closely, you can see the splint.

The next photograph (Fig. 16c) shows this patient four months later. He was an American lad who had enlisted in a Canadian regiment. In almost every convoy were one or two Americans. I asked this patient how many Americans there were in his regiment, and he answered, "fifty Canadians." (Laughter.)

All wounded men are immediately innoculated against tetanus at the clearing station. This innoculation is so effective that, of the 17,000 wounded received at our hospital, only three developed tetanus. Although every possible means known to medical science was used to save them, all three died after suffering the most horrible agony. I became interested in tetanus, and on inquiring at some eighteen hospitals of 1,040 beds each, I learned that very few cases of tetanus developed, but all that did develop proved fatal.

Fig. 17a is the photograph of a lance corporal who was struck in the mouth, either by pieces of shrapnel or else by a bullet which exploded on striking the teeth, during the repulse of a German attack. Half an hour later he found himself sorting out his teeth in his hand, and asking for the dressing station. He was able to walk the half mile to the dressing station, where his wounds were temporarily dressed. After his injured eye had been removed at the clearing hospital, he was brought to the oral surgery hospital.

In addition to the eye wound, the patient was found to be suffering from a transverse facial fracture, which necessitated the application of a Kingsley maxillary splint. The X-ray (Fig. 17b) shows how severely the jaws were peppered by shell fragments. The mandible was not fractured, but it was necessary to place several drains. Fig. 17c shows the patient at the end of three months.

One night, about two A. M., a party of Germans were repairing the barb wire entanglements in front of their trenches, when a squad of British bomb throwers stole out to hurl a few grenades at them. This young grenadier (Fig. 18a) was shot by a German sniper just as he was about to throw a bomb at the enemy. (Fig. 19.) He felt no pain, but covered his wound with his field dressing. He was afterwards carried by a stretcher bearer "pick-a-back" down to the communicating trench. Here he lost consciousness, and awoke to find himself in the base hospital.

The bullet, fired from a distance of fifteen yards, had blown away the right eye, a part of the nose, the zygoma, and outer wall of the antrum, and had produced a transverse facial fracture. It was possible, by grasping the upper teeth, to move the whole face a quarter of an inch up and down. A Kingsley maxillary splint, similar to the one in Fig. 17a, was used to hold the bones of the face in position.

Three months later, Dr. Neff grafted the side of the face from the patient's right arm. Later, the covering of the nose was brought down from the forehead. A month after this, the bridge of the nose was grafted from the tibia. (Figs. 18b and c.)

At four A. M. this victim (Fig. 20a) was in a front line trench, cleaning his rifle, when the Germans fired a volley of about three hundred rifle grenades. One of these burst near him, striking him in the antrum and in the right hand. (see Fig 19b.) An X-ray was taken (Fig. 20b), and the shell fragment was removed. (Fig. 21). In many cases where the patient swallowed a great amount of pus, a gangrenous appendix developed. This was such a case.

At one point during the battle of Loos, the British had captured two trenches, and were attacking the third, when this young private was hit. (Fig. 22a.) He was carrying sixteen bombs at the time. A bullet entered his open mouth and passed through the neck, carrying with it that part of the mandible between the cuspids.

The X-ray (Fig. 22b) shows the splint applied to hold the two portions of the mandible in their proper position until a bone graft could later be placed between them. Very few of the cases coming to us had sufficient teeth properly to place such a splint.

This same patient developed septic pneumonia. He entered the hospital with a temperature of 103.5° F. Most such cases die before they can be brought to the base hospital. The condition of the wounded during a big offensive is terrible. At the battle of Loos, the dead could not be quickly removed from between the firing lines. At night, the soldiers would crawl out, drag the bodies back to the trenches, and then throw dirt over them. Thus many dead were buried right in front of the trenches. When a shrapnel hit such a spot, the horrible mess was spread in all directions. Can you wonder that shrapnel wounds are so septic?

An official history of each patient was kept in addition to the clinical charts. The following is a copy of the history of the patient whose case is illustrated in Figs. 23a, b, c and d:

SGT. JAMES BROWN.

Regiment No. 8336. *Unit* 1*st Yorks Lancers*
Age 27. *Service* 10 *years...Single*

Place of Action:

Near Verlines about 2 P. M., Oct. 1, 1915.

Injury or Illness:

Compound Fracture of Lower Maxilla.

Mandible blown away from right lateral to about ½ inch above the angle of the jaw and the whole face including part of the tongue. The part missing on face extended from center of chin down to lower boarder of neck, back to ear, and almost up to nose.

Immediate symptoms:

Profuse hemorrhage, no pain. 1st aid by stretcher bearers. *Tetanus Antitoxin* administered at 1st dressing station.

When patient arrived his face wound was in a horrible condition; patient running a temperature of 103; much gangrenous tissue, could smell it a block away.

Treatment and Operation:

Cut away gangrenous tissue and dressed with a solution of eusol, diluted two-thirds, every four hours, and irrigated. Pulse being very weak, 1-30 gr. strychnin was administered hypodermically every six hours. After 10 days' treatment wound began to granulate in nicely. Patient had to be fed with tube. Diet: eggs, milk, orange juice, stout, and custard. Wound irrigated every 4 hours with 1-10000 solution of potassium permanganate.

Nov. 1, 1915. Removed piece of necrosed bone ½ inch square.

For the upper and lower teeth on the left side German silver plates were swaged, covered with silver solder and a wire soldered to the buccal surface with several loops. On the buccal of the lower plate a heavy piece of German silver plate was soldered which glided on surface of upper plate when patient closed jaw, throwing jaw over to left in its normal position. The first plastic operation was performed three months later. The piece of the mandible lost was replaced by a graft from the tibia. A small vulcanite splint was made to fit between swaged upper and lower plates which were laced together through loops that were made on the buccal surfaces, holding the patient's jaw open about one-half inch and immovable.

How occurred as told by Brown:

"The Germans had driven us out of our trench. We had retaken it; I had just fired over the parapet at a retiring German when I felt something hit me in the neck, which I believe was a German bullet, fired from a distance of twenty yards."

Personal letter written by Sgt. Brown:

"Arriving at Vermelles on the 26 of Sept., my regiment was ordered to support an attack which was to be made on that date by a brigade of my division. We arrived at the supporting point, which was the old British front line trench, our front line then being the Boche trenches which had been captured by some of our boys the day before. The attack was a success, so our support was not wanted.

The same night two companies of my regiment were ordered up in local support of a regiment of the attacking brigade who were having rather a hot time with the Boches who were making repeated bomb attacks, trying in vain to recapture their lost position. After breaking through numerous communication and fire trenches which were filled with dead and wounded of both sides, which he had to trample on; add to that, mud up to the waist, also water and slime, we eventually arrived at the trench we were to occupy, (we had been shelled to blazes coming up), in which a bomb attack was in progress. After beating the Boches, the company we had to relieve came out and we went in. Then the fun commenced. It was bomb attacks from daylight till dark and in the dark thrown in; they bombed us out, we retook the trench with the bayonet and bombs and so it went on for 48 hours, we were still occupying the same trench. We had had no water or food, the trench full of German and our dead, also mud and water, for 36 hours. All the officers in my company killed, also my platoon officer and all the other N. C. O.s also killed or wounded except one other sergeant and myself, he being wounded later. There were only 19 men left in my platoon and we were repelling another bomb attack when something hit me under the jaw and I was out for the count. I thought someone had thrown a house at me. I was led away to a trench in the rear and the man put his first field dressing on my wound and took me to the first aid station which was situated in a trench about 200 yards farther back. I was dressed by the M. O. of the E. Y. Regt. and stayed there until 11 o'clock at night, being there about 12 hours. I was then carried 2 miles farther back to the advance dressing station at Vernelles, which was a cellar underground. There I waited my turn on the line of stretchers and was dressed again and inoculated and sent to Bethune by motor ambulance and remained there about 24 hours when I was put on a canal barge and sent to St. Omer and then down to the base hospital train to Etaples where I was admitted to the American Hospital and consequently handed over to Dr. Meyer, under whose care I have been for the last 4 months."

The Tommy in Fig. 24a was taking part in an attack on a German trench when he was struck by a rifle bullet just three yards from his own trench and thirty yards from that of the Germans. He fell, bleeding quite freely. From 2 P. M. until 3 A. M., for thirteen hours, he lay there. Finally a wounded corporal placed a first aid dressing on the wound. This incident illustrates the difficulty with which wounded are brought back from the firing line after an attack.

The bullet entered the face on the left side, passed through the antrum, through the posterior portion of the palate near the lingual surface of the third molar, then through the right tonsil and out on the right side of the neck. (Fig. 24b.)

Fig. 25. This patient was hit by a rifle bullet while carrying messages one mile back of the line. The bullet entered the left side of the face a little below and in front of the ear, tore away the whole angle of the jaw on that side, passed through the root of the tongue, and through the right side of the mandible in the region of the first and second molar, splintering off about an inch of the bone. The silver probe shows where the bullet passed through.

There was so much edema of the tongue that a tracheotomy was necessary. Even with the jaws open two inches, the tongue was swollen enough to completely fill the mouth.

Fig. 26 shows a case almost identical to the preceding one, except that the missile was a shrapnel bullet. Here, too, a severe edema of the tongue was present, but did not necessitate a tracheotomy. It was ironical that the bullet was from a *British* shell, which fell short. The artillery had not yet found the range.

Fig. 27a. Another lucky wound. A rifle bullet, fired from a distance of two miles, entered the left side of neck two and a half inches below ear, missing the external carotid artery by a quarter of an inch. The bullet found exit on the other side near the apices of the first and second molars, knocking off a slight fragment of the lower border of mandible. The X-ray (Fig. 27b) shows this fracture. This is the only case I had where the mandible was struck by a bullet or a piece of shrapnel, in which the resulting fracture

was not complete and comminuted. Secondary hemorrhages developed in many cases similar to this one after a period of about twenty-one days. This patient however was lucky.

It is noteworthy that rifle bullets, shot from a distance of a mile or over, usually produce wounds that are relatively small and clean cut, while wounds from fragments of shrapnel casing or from rifle bullets at short range are apt to be large and jagged. (Compare Figs. 25 and 27a with Figs. 18a and 23d.)

Still another lucky shot is shown in Fig. 28a. A rifle bullet entered the right face one and a half inches below the eye, and left in the left mastoid region. This case was successfully treated in Major Leighton's service.

This Canadian (Fig. 29a) was crawling along the ground in the dark about thirty yards from the German trenches, taking observations for a premeditated attack, when he was hit by a German sniper. The bullet entered under the arm, passed upward and came out of the shoulder, fracturing the clavicle and severing the brachial plexis nerve, thus causing the patient to lose control of his left arm. After leaving the shoulder, the bullet struck the mandible, fracturing the angle of the jaw.

There were very few cases in which the teeth could be wired, because of the possibility of ankylosis where a large amount of muscular tissue was torn up. In this case there were a sufficient number of sound teeth to wire with good results, so the danger of ankylosis was risked. Colonel Neff later sutured the severed nerve and the patient slowly regained control of his arm. Fig 29b shows the wires in place just before removal after a union had been obtained at the angle. Fig. 29c is the patient convalescing.

This (Fig. 30a) is a relatively prosaic case. The patient was kicked in the jaw during a game of rugby back of the lines. I show it because it is the only simple fracture I met with in France, and because the X-ray (Fig. 30b) illustrates what good approximation can be obtained by using the Thomas L. Gilmer method of wiring the teeth when the fracture is at the angle.

This sergeant (Fig. 31a) was a British sniper who got some of his own medicine. The bullet entered as shown in Fig. 31a, and left through the back of the neck. (Fig. 31b.) The X-ray (Fig. 31c) shows a generous portion of the mandible splintered and blown away. The left side of the mandible was missing between the cuspid and second molar. A metallic splint was placed to hold the fragments in normal position until the conditions were favorable for grafting.

This patient told me that the German snipers have a special sight on their guns. "For several days there was one German sniper near us who every now and then would manage to shoot one of us down. We tried every way we could to get him. Finally I made up my mind to have him and I got up on the trench. That is how I got this bullet wound through my jaw, but I stayed there. I didn't give up. I was going to take another wound and be finished or else get that German. I finally got him and I hope to God he lived long enough to know that I shot him with the naked eye."

Fig. 32a shows a patient who was in the hospital when it was taken over by our unit. He was running a high temperature at the time, but after the removal of several pieces of necrosed bone and after thorough irrigation, his temperature quickly fell to normal. He became too active, however, and during the next few days he had repeated hemorrhages which nearly resulted fatally. After all other methods failed to stop the hemorrhages, resort was finally made to ligation of the external carotid artery.

It was necessary to treat the compound fracture of the mandible by wiring direct to the fragments; since the patient had no teeth. This was successful.

(In all the cases I saw in which direct bone wiring in the mouth had been done by surgeons, the wires sloughed out, due to the septic condition of the wound. I learned at the American Ambulance in Paris that they had a similar experience there. The wiring, however, served the purpose of holding the bone fragments in place temporarily, thereby preventing the loss of the whole fragment.)

This patient was pitifully anxious to live and get back home; for he was married and had ten children. His wife received from the government twelve shillings a week, while each child got three shillings six pence. At the beginning of the war, this man, like many other married men, enlisted under the promise from their employers that their salaries would continue throughout the war. But the war has lasted too long, and in many cases the pay has stopped.

The patient in Fig. 33a was stationed in an advance trench within fifteen yards of the German line. Just at daybreak, while peeking over the parapet, he was struck by a rifle bullet which exploded. The bullet entered the right side, fractured the mandible as shown in the X-rays (Figs. 33b and c) and made a wide exit on the left. The splint in Fig. 33c is the same kind as that applied to the patient in Fig. 34a. Fig. 33d shows the patient four months later.

As can be seen from Figs. 34a and 34b, this patient had a compound fracture of the mandible between the cuspid and lateral. The treatment in this case was that used successfully in many others and was as follows: German silver pinch bands were placed on a number of the lower teeth on either side of the fracture. The ends of these pinch bands were allowed to project outward. Then the upper and lower teeth were wired together, thus bringing them to normal occlusion and reducing the fracture. Next an impression was taken of the buccal and labial surfaces of the teeth, *together with the ends of the pinch bands.* This impression was removed, the pinch bands were taken from the teeth and properly placed in the impression, and an investment was made with the bands in position. After cutting off the projections of the pinch bands, a heavy German silver wire was soldered to the bands on both the buccal and lingual surfaces. The wiring was then removed from the teeth, and this splint was cemented in place. Fig. 34c shows the patient two weeks later.

The patient in Fig. 35a was looking over the parapet instead of using a periscope. A bullet passed through the chin, producing five complete fractures of the mandible, each one comminuted. There was one at the angle and one in the bicuspid region on each side, and one, a transverse fracture, was in the anterior region. On reaching the hospital, he was running a temperature around 104°, and his mandible was a mess, with pus everywhere. After thorough irrigation and drainage had alleviated this condition, the fractures were reduced and a heavy silver bar was wired to the lower teeth (mostly old stumps) by drilling holes through them.

Fig. 35b is an X-ray taken before the fractures were reduced. The next X-ray (Fig. 35c) shows the rearrangement obtained, while Fig. 35d shows the patient three months later.

Figs. 36a, b, c and d illustrate another prosaic case. This man was kicked by a horse. He was wearing a full upper and lower set of plates at the time and these were knocked into a dozen pieces and lost. The right condyle was driven back of the glenoid fossa into the ear, while the mandible was fractured on both sides. An intermaxillary splint in combination with a bandage was used to hold fractured parts in position.

The remaining pictures (Figs. 37-48) show cases from the general surgery departments of our hospital. Very few of the wounds are sewed up immediately. If this were attempted, the patient would die of gas gangrene in a short time. It was proved that fully seventy-five percent of the shrapnel fragments taken from wounds showed the presence of gas bacilli. Fig. 37 is such a test.

Each tube contains a piece of shrapnel immersed in a culture medium. By close oberavtion you can see light irregular streaks of bubbles which arise from the bottom of the tubes. They have the appearance of canned fruit "working."

Figs. 38a and b show a case of gas gangrene. The surgeons now make multiple incisions in the wounds to let in the air. At first such wounds were irrigated with peroxide, but this was found to be invariably attended with a rise of temperature. They are now using eusol solution (a dilute solution of boracic acid and chlorid of lime). In some cases the wounds are also injected with oxygen to prevent the growth of anaerobic bacteria.

A peculiar infection developed in the foot of a man cut by a barbed wire (Fig. 39). Dr. Davis dissected out two guinea worms, one twelve inches long and the other fourteen inches long. Fig. 39, showing guinea worms partly dissected from foot.

After we were three months on the continent and the oral hospital had been organized, the General in Command permitted me to go with the medical staff on an inspection tour of the British and French clearing hospitals, dressing stations, and front line trenches. We passed through many beautiful fields, which yielded such excellent crops last year. They are now being tilled by women and children. The seventeen-year-old boys have all been called out; it will not be long before the sixteen-year-old boys will follow them. You seldom see a man on the street, and I tell you that I never felt so cheap in my life as I did when I went about Paris in civilian clothes. I knew everybody was looking holes through me and thinking, "That big lubber is loafing about the streets when he ought to be at the front." It is this universal sentiment that makes it so unpleasant for the boys in England that they are simply forced to enlist.

On our journey we came to a spot where some cavalry were swamped up to their knees. They had been brought back about twenty miles from the front line trenches and stationed there in the mud. A little farther on we stopped at General French's headquarters, where we had lunch—but not with General French.

After passing the outlying trenches, which in some places extend back as far as fifteen miles from the firing line, we reached the flat ruins of Ypres, formerly a city of seventy thousand people. There is left standing absolutely nothing but a portion of the cathedral spire, which the Germans have spared in order to get their range.

Finally we came to the artillery, most of which is stationed about five miles back of the first line trenches. Here we banqueted with them on bully beef and hardtack. We could not proceed with safety until dark. About ten p. m., after putting on hip boots, we started to wallow up to the firing line. We went with a battalion ordered to the front line trenches on relief duty. Over half the way we plodded through mud up to our hips. The men must live in that mud and slush day after day. There are soldiers who have suffered dislocation of the hip as a result of being pulled out of the mire by their comrades with ropes.

When we came to within a mile of the firing line, the mud was so bad that we were forced to walk the next ½ mile on top of the parapet. While we were stumbling along one of the men about ten feet ahead of me dropped over dead. A stray shot had found a mark in the darkness. First down at this end of the line, then a little farther along, a machine gun would sputter and send out its grim message of bullets. Occasionally a sniper would contribute a single shot to the medley of explosions. All night long this went on. At intervals a rocket or star shell would mount heavenwards, illuminating the trenches all around with a wierd green light, and giving the snipers a chance to do more accurate destruction. (Fig. E.)

It was twelve o'clock when we finally reached the front line trench. This particular trench was but thirty yards from the German trenches, and we could actually hear them talking. We could hear the rifles barking intermittently all along the line. One thing I noticed especially was the coolness of the men. I saw four men killed during the twenty-four hours I was there. Whenever a man dropped, he was picked up and carried away. Nobody seemed to worry about anything and for that reason I felt little fear. If they had been excited I would have been scared to death. Everyone was so calm and everything so matter of fact, that I caught some of the same feeling.

Back of, and roughly parallel to, the firing line, additional trenches are dug at intervals varying from thirty to three hundred yards. They are thoroughly connected by means of communicating trenches. This network of trenches extends all the way from eight to fifteen miles back of the firing lines. Fig. 49 is a diagram showing the zigzag form of both the main and communicating trenches. All the supplies, ammunition, food, and reserves, for the trench we visited had to be brought through communicating trenches for almost five miles.

That is the reason why, in a drive, an attacking army cannot capture more than one or two lines of enemy trenches. They cannot bring up reserves fast enough or establish communications. Last fall, during the battle of Loos, the British were able to take three lines of trenches. With what results? The Germans soon recaptured much of the ground lost.

But first I want to explain the arrangement of these trenches more in detail. All along them, at intervals of about ten yards, is stationed a sniper, whose duty it is to observe what is going on on the other side, either by bobbing his head above the trench, or by using a periscope. If he sees a little dust or smoke anywhere, he aims his rifle, which is mounted on a tripod, at that particular spot. Then he watches. As soon as another move is made there he pulls the trigger. If it is a man sticking his head up, he gets it. Sometimes it is merely a clod of dirt pushed up to deceive the enemy and draw their fire. In addition to the snipers, there is a machine gun about every twenty yards.

A MEMBER: How deep are the trenches?

MAJOR MEYER: They are six to eight feet deep and are zigzag, every which way. They are built up in front with sandbags.

Just in front of the trenches is the barb wire entanglement.

If a shell tears down any of it during the day, the men must get up on the parapet at night to fix it. If the Germans happen to send up a star shell, these men are usually picked off by snipers. About ten yards from the first trench, and just in front of the communicating trenches, you will notice bomb stations. The grenadiers can crawl into these and throw bombs over into the enemy trenches.

In these same places are listening posts for detecting mine-digging by the enemy. I was told that the listeners could hear whatever mining was going on, and even the men in the trenches could hear the digging directly below them. About two o'clock in the morning we were taken down into one of the mines. It reached to within ten yards of the German trench.

These mines are about thirty feet deep and four feet square, and are dug at intervals of about a tenth of a mile. Occasionally, as you can see in the diagram, the British and German mines almost come together. In this case, the first side to detect the other stops at once and places a blast. At night when the enemy come back to dig—all this mining is done at night—they are blown up.

Before a charge or drive is made, a number of these mines are dug all along the line, and charges are placed in them. Then the artillery gets ready, usually from one to five miles behind the first line trenches. In the meantime the men in these trenches have placed their little ladders about ten feet apart all along the line. .Just before the mines are blown up—when they do blow up you can see nothing but arms and legs; it is an awful mess, they told me. I never saw a mine exploded, and I don't want to either. Just before the mines are blown up, these men are all stationed at their ladders. After the mines are exploded the artillery begins to throw its sheet of hell into the front line of German trenches. (In what follows let us suppose the British are taking the offensive.) All the time the shells are screaming over them, these poor fellows in the trenches are standing on their ladders, waiting the command to charge the German trenches and knowing that ninety out of every hundred of them are going to be killed. While they are standing on the ladders listening to that devilish thunder all round them, many of the men go insane. It is more than their shattered nerve can endure. After the artillery has ceased firing, the men rush up from their ladders, and then the Germans mow them down like weeds. It costs thousands of men. Finally, if they do reach the front line trench of the enemy, all they capture is a handful of German machine gun operators.

I forgot to say that at various places along the trenches "dug-outs" are constructed about eight feet deep and roofed over with limbs and about five feet of dirt. This makes them proof against shrapnel but not against the big "Jack Johnsons." When the British capture a German trench, the bombing squad must rout out the Germans by dropping bombs into these places.

Suppose the British do take a series of German trenches, what happens the next day? They cannot bring up their reserves to go any farther. It is impossible to go any farther, for the German know the exact position of the trenches just captured by the British, and they begin dropping shell after shell into them with great nicety. That is why you see in the papers that the British took three lines of German trenches and that the next day the Germans retook them. So it goes, zig-zag back and forth. After such a battle a small diamond shaped spot on the map will indicated all that has been gained, while there have been lost in killed and wounded, thirty or forty thousand men. I think the British and French decided last fall that, if they ever win, it must be in this slow costly way. (See Figs. 50 and 51.)

The Germans are wonderfully equipped and organized. No matter what takes place on the British side, they know of it. They could almost tell my name in there. If they had known I was partly of German descent they would have had me. (Laughter.) Their spy system was quite thorough. They could often call out the name of the opposing commander. Nobody seems to know just how they do it, but they do it.

There are very few prisoners taken in the northern part of France. The only ones I saw during my service in France were seventy-five wounded men.

Fig. 52 shows a squad of motor message carriers. They frequently go about in groups of five, so that if one is put out of commission by a shot or shell, the others pick up the message and go on.

The pilot in Fig. 53 lost his life a few days after the photograph was taken. I was fortunate enough to see one of the air fights. As soon as an enemy plane appears over the line, these men go up and get after him. The man who gets on top usually wins. An air duel looks like two little birds fighting in the sky.

MEMBER: How are the planes destroyed?

MAJOR MEYER: By means of rapid fire guns mounted on the planes.

I told you about how much the nurses did for us. This picture (Fig. 54) shows one nurse's tribute. This nurse, Miss Hamilton, was on a case until noon of the day the patient died. At twelve o'clock the next day she was herself dead. She had contracted spotted fever from the patient.

My wife was not allowed to accompany me within the British War Zone, but they gave me permission to see her just twice during my active service. One night in August while she was in London, she was awakened by an awful thunderstorm, as she thought. When fully aroused she found it to be a raiding Zeppelin. (Fig. 55.) It passed directly over her apartment, and the anti-aircraft guns were shooting at it from all sides. This event so impressed her that she moved to Paris.

One night during our last week in Paris, we went to a nickel show (price fifty cents). On coming out we saw the search lights flashing, while all the other lights were extinguished, so we knew a Zeppelin was coming. In London every night after six o'clock the search lights are continually sweeping through the darkness, but in Paris they are never used except during a raid. Soon we began to hear a rumbling which sounded like thunder in the distance. It came nearer and nearer until the explosions were terrific. That night the Zeppelin came over Paris, dropped its bombs and went away, and not a search light spotted it, and not a person saw it. This shows you how easily they can "get away with it."

A Zeppelin is always detected by its noise as soon as it passes over the firing line. Warning is then telephoned to Paris at once. which gives a half hour to put out the lights. The firemen in Paris warn the inhabitants by horns and bugles. The people close their doors and shutters, but they do not rush to the cellars. They go out in the street and look up into the sky, like we do on the lake front during an air meet.

Once during an air raid, three bombs were dropped on the railroad just in front of our hospital, tearing up the tracks. Three more bombs, which did not explode, fell at the hospital next to ours, one block away. Six bombs were dropped at a convalescent camp one mile distant. Here several people were killed and much damage was done. We had no protection from the air ships, so that they could do about as they pleased.

If time would permit, I would like to show you some of the things we saw when we visited the French front line trenches and their clearing hospitals. We found conditions there practically the same as with the British, but the French soldier is not so well dressed as his British brother. His clothing is worn and torn. They are making the fight of their lives. Even the enemy must admire them.

On our way back we stopped in Paris and called at the Amercan Ambulance where Drs. Hayes and Davenport are doing the excellent work in oral surgery about which you have doubtless read. They are doing the mechanical part of the treatment. The surgeons do the plastic operations and place the bone grafts after the mechanical appliances have been made, fitted, and placed by the dentist. I wish I could picture to you the remarkable results obtained there through the close relationship which exists between the dentist and the surgeon.

On our arrival in Paris, we were led to believe that there was little oral surgery being done by the French, but after visiting l'Ecole Dentaire, of which Dr. Godon is director, we found an equipment of one hundred chairs, with forty dentists operating, each assisted by three mechanics. When the war is over, and the French literature on oral surgery is published, the world will marvel at the wonderful work that the French are doing. If you could have seen the dozens and dozens of mutilated jaws and faces that were made to look quite presentable, you would agree with this statement.

At this school they were making a thousand plates a week. It was very impressive to see all those dentures waxed on and ready to vulcanize. For making these plates they are allowed by the French government the princely sum of seven francs! Think of it—an upper and lower denture for a trifle over a dollar! Less extensive work receives a smaller fee. To meet this price they are using porcelain only on the six anterior teeth, and the back teeth are carved in the wax. As I have said before, they are vulcanizing the dentures *off* the model, so that the latter may be preserved.

Next we called at the Val de Grace French military hospital for head, jaw, and eye cases. Here Dr. Morteson and Dr. Frey were doing the oral surgery. There were some eight hundred patients in the hospital at that time. We saw many cases in which lost parts of mandibles had been replaced by grafts from the tibia and many others where the bridge of the nose had been built up from grafts of intercostal cartilage. In some cases, in which the eye and its orbit had been torn away by a shell, a plastic operation was performed and a new eye splint was made. Some patients, the side of whose face had been shot away, were wearing a covering over the missing eye. On this covering an artificial eye was painted so cleverly that the substitution could not be detected from a short distance.

At this hospital we saw several patients who had been captured by the Germans after being wounded and who had been later exchanged for German wounded prisoners by way of Switzerland. They had been treated by German oral surgeons, whose work was superb.

The French have also established a large oral surgery hospital at Bordeaux and another at Amiens. We visited the latter, where Dr. Ball has charge. He, another surgeon and two mechanics were taking care of more than one hundred severe cases. They were making most of their splints from cast aluminum.

At the Japanese hospital in Paris we watched them dressing wounds in the operating room. They certainly never made a false move. They told us that they were doing a little oral surgery but we were so interested in the cute little Japanese nurses that we forgot to visit the oral surgery room.

In my talk tonight, gentlemen, I have tried to give you just a slight outline of my experiences in about a year's service, and I am sorry that I cannot tell you of all the conditions that existed over there as I saw them. I thank you. (Prolonged applause).

THE CASE OF THE INDIVIDUAL.*

BY DR. ARTHUR G. SMITH, PEORIA, ILL.

If all human progress were steady, logical, calm and deliberate, what a hum-drum and uninteresting world this would be! Life would possess exactly as many possibilities of surprise as a problem in arithmetic or an astronomical calculation!

It requries, however, only the most casual study to show that the line of advancement has seldom if ever been straight and direct but far more often, wildly erratic and zig-zagging; rushing now to this side, now to that, of the final course where safety and sanity were ultimately found to lie.

Twenty-five years ago our profession began to emerge from the punitive conditions which had, up to that time, surrounded it and largely influenced its hitherto somewhat meager development. Up to that time every practitioner was very largely self taught—a sort of graduate of the University of Hard Knocks—obliged to go about his work in his own way; attacking as best he could, in a do or die spirit, almost every sort of professional problem that presented itself. At that time science, as a dominating factor in human affairs, had not made itself at all strongly felt, and practically not a single basic principle upon which our modern practice is founded, was even foreshadowed or dreamed of. Each man went his own way, learning what he could, as best he could, keeping all to himself; lonely, self reliant, scornful of the opinions and abilities of others—yet strangely different about meeting his confreres, either socially or in professional gatherings. This was the end of the way travelled by those men whom we might call the personal empiricists and wonderful men they were, many of them, practicing with a somewhat narrow but highly developed technical skill and an indifference to physical and nervous fatigue that is almost incomprehensible to us of today.

With the developments of science all this professional aloofness and fervid individuality has been utterly changed. As we began to have scientific and impersonal professional matters to discuss we rapidly became eager to meet together and talk things over. The increase in cohesion among us during recent years has been astonishingly rapid, and more and more have our writings and discussions become scientific and impersonal and ever greater has become our enthusiasm for meeting together and talking over the many and wonderful discoveries, reports, etc., with which our ample literature is now crowded.

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*Read before the Illinois State Dental Society, May, 1916.

As a result of this new state of affairs many strange things have gradually come about. Perhaps the strangest of these is the fact that we have actually come to think of ourselves and our activities in a large and collective way. We regard ourselves as "a profession," engaged as a profession, in fighting certain classes of diseases (as dental caries, pyorrhea, malocclusion, etc.) and are apt to lose sight of the fact that all of these things which we talk so much about and regard so highly, never alone and of themselves benefitted a single person in all the world.

This fervid pursuit of scientific generalities is all very natural, for we say the mistake of the selfish aloofness of a former day, while our meetings gave us a breadth of vision and a measure of inspiration such as we had never known before. The uplift that comes with positive knowledge, and the hope of high accomplishment, went with us from each assembly or set at our elbow as we studied books and magazines.

Thus again and again have we been convinced that in this or that method of procedure, lay salvation for this or that class of disorders.

Time after time have we hitched our little wagons to the Star of Method, and with the utmost assurance composed ourselves to await that great forward march of events. With what results?

As a rule events *have* moved forward and taken some of the attached wagons with them for an appreciable distance! Yet it is certainly true that as a rule, the real net forward gain has been less than was expected, and many a gay little cart has become permanently detached, bruised and broken, before the march was well under way!

Now, every new method, each scientific fact, has been given to us by men whose very personality was an absolute guarantee of sincerity, ability, and intergrity; yet the results obtained in actual practice have been often disappointing. Why? Because as a profession we have become method mad.

Because we have reacted too far from the days and ways of the men of former generation. We have shaken ourselves too free from their ways of calm judgment, lonely self reliance, and marvelous, if narrow, technical skill. Method having done so much for us, is being worshipped as the idol of our profession, and we are falling down and placing upon its altar as offerings, our own powers of keen observation, close analysis, and calm individual opinion.

From the former absolute dependence upon unsupported personal judgment we have come to a point where we gladly rely almost wholly upon method and the voice of authority. In a word we have studied too closely the text book, the lecture, and the lantern slide, and too casually the sensitive, human document that is ever before us—the individual in the chair!

From the standpoint of this person—whose welfare is, after all, of considerable importance to us as well as to himself—no method is of any value whatsoever, except as it expresses itself, through our fingers, in terms of comfort, relief, and service, and these in the particular form and manner in which that particular individual understands and values these things.

If each patient were a fixed quantity—as the materials with which we work are fixed quantities—how easy things would be; but as a matter of fact, no two people in all the world *are* alike, and the service that would prove itself worth and satisfactory to one will prove exactly the opposite to another; hence close study of the personality of the patient becomes of very first importance if we are to give the best that is within us to each individual. And what, after all is so absorbing, so wonderful, and so endless as the analyzing of the variants of personality, and the application of our conclusions to determine the exact kind and extent of work to be undertaken?

In this study we can all say with Walt Whitman that "Whatever we may know at any given time there always waits for us more that we do not know."

It is in the hope of calling attention to some of the needs of further individualizing our advice and services; in an effort to assist if possible, the intelligent study of some of the main points on which operative success may be said to depend, that this paper is undertaken.

Let it be said in a general way that the more intimately we know any patient, the better are our chances to render to that patient exactly such services as will spell satisfaction in their particular case.

The core and heart of this whole matter may be said to lie in the ability of the operator to grasp the problem, in its entirety, *from the standpoint of the patient.* As means of great assistance to this end are the considerations of the age, sex, health, intelligence, and social position of the person for whom we are working. These are the main considerations which must govern the general planning of our work. Details of the particular construction to be employed must be determined upon by the closest study of everything that it is possible to unearth or run down in regard to the particular individual whose welfare is being studied.

It is this branch of the subject that is practically inexhaustible and infiinitely fascinating, and it is exactly for failures to properly adapt our *methods* to those individual conditions that disaster is often incurred.

After studying the case to the utmost of our ability we must fairly and honestly face the total array of facts established, and plan a resoration that will give fair promise of service under *all* the conditions found to be present. In other words we must find the answer to each problem by using all the factors of that problem, and never by ignoring or winking at, the really difficult phases.

In getting at basic information, every possible opportunity for studying the patient should be diligently improved. Particularly should we try to take advantage of those comparatively rare moments of complete mental abstraction—for then only do many nervous patients do the very things that have wrecked their natural teeth and which will in turn wreck our work unless we guard sufficiently against them.

The questions bearing on the condition of the mouth and the points under consideration, should be serious and searching. All answers should be mentally checked up against existing conditions in the mouth, with a view of making proper allowances for conscious or unconscious misrepresentations. (In all charity it should be remembered that very few people make good witnesses either for or against themselves, and in addition to this fact, it is often downright impossible for a highly intelligent patient to give an accurate answer to a very simple though, from our point of view, a vastly important question.) How many people will admit for instance that they clench or grind their teeth almost continually during sleep?. Yet this habit is quite common, it seems to be entirely outside the reach of any remedy of either the patient or operator, and when present, constitutes one of the difficult factors which must be fairly counted in and solved, before any measure of success can be expected.

Unusual signs of severe stress or wear should be carefully looked for, and their explanation discovered if possible. When asked about these matters, a patient will often confess complete ignorance as to their cause; or again after confessing to some bad habit, it may be said, "I used to do that a lot some time ago but have not done it recently," or perhaps something like this; "Yes, I know that is one of my bad habits, but just fix me up right again, Doctor, and I will stop at once."

All these statements and promises—while well and seriously meant—are not to be depended upon to the extent of justifying us in placing restorations which are totally incapable of withstanding the natural consequences of their occasional or even habitual infraction; for it is an indisputable fact that the fixed habits of years, in such matters as the movements of the jaws, or the uses of the teeth, are only very imperfectly under the control of the conscious mind.

The woman who has done much sewing in her lifetime, and who has bitten off her thread countless thousands of times, may make many and sincere promises to you and herself that she positively *will not* do the thing again; yet it is practically inevitable that in a moment when her conscious mind is off guard, the easy, familiar sequence of muscular actions will certainly occur. Unless we have guarded in advance against this action, wreck and disaster are almost sure to overtake our work in such cases.

The "Board of Trade" man who, in the heat of his brief day, is in the habit of crunching violently a few kernels of hard wheat or corn, must not be too severely blamed if he forgets himself occasionally and slips back into the habit of years.

(As showing to what extreme lengths of misuse our work may be occasionally subjected the following case is cited from practice.) A man—in all other respects highly intelligent—had largely wrecked his own natural teeth through a habit of cracking prune pits in order to eat the meaty kernels. The bridge placed to supply the teeth that had been so destroyed has been subjected to the same strange use; remonstrances as to the folly of such a course are of no avail whatever, and the patient points serenely to the fact that the only damage to the bridge, in several years of such use has been an occasional broken facing! Of course this is an extreme case, and no bridge ought ever to be required to withstand such punishment, nevertheless it is a fact that in many difficult and unusual cases, hope of lasting success lies, not in depending upon the patient to abandon bad or unusual habits, but in so fully grasping the requirements of, and dangers to, each operation that the danger thus foreseen is adequately guarded against in the very manner in which the work is undertaken.

Perhaps no modern operative procedure is more dependable, or more nearly of universal application than the one that has come to be known as "Extension for Prevention" in cavity preparation. In the vast majority of cases it acts as an absolute barrier against the bugaboo of former years; recurrent caries. Yet in most cases of senility, and in a very few cases of early adult life, there will be a rate of susceptibility to caries that will give any careful dentist pause when it comes to the question of promising to the particular individuals so afflicted, any permanent relief from the discouraging and persistent recurrence of decay. These facts are hard, they are humiliating, but they must be honestly faced and truthfully and fairly dealt with when they are encountered even if so doing involves, for the time being, the casting to the winds of all usual theories and accepted methods of cavity preparation and operative procedure.

In what seems to most of us so simple a matter as the personal care of the teeth and mouth by the patient, there is much that must be carefully considered for there seems to be the widest possible degree of variation with different individuals in such matters. One patient will invariably present with everything in the mouth in an ideal condition of cleanliness, while another—perhaps just as intelligent and conscientious, will prove entirely unable to so care for their own mouths as to maintain them in any other than a most deplorable state—bordering perhaps on downright filthiness. In short it seems to be a fact that the proper and usual care of the teeth and gums is a matter that simply cannot be mastered by a few people—good people, from whom one would naturally expect these usual refinements of the toilet as mere matters of course.

The dentist who ignores, or who stubbornly refuses to admit facts along these lines, when studying out a line of procedure, is deliberately inviting failure for his own work as well as doing no small thing to bring about a lessening of confidence in all dentistry.

All these things are important. The patient has a perfect right to expect and demand of us that we know about them, and that we proceed with our work in such a way as to achieve a fair measure of success in spite of whatever difficulty or discouragements may be present. It is time that we stopped blaming methods and patients for many of the things that happen to our work!

In the matter of the treatment of pyorrhea, clinical observation seems to point unmistakably to the fact that prospects for successful treatment and ultimate recovery must still be more largely dependent upon that mysterious something within the tissues of the individual patient which for lack of a better name we sometimes define as "ready response to treatment" and that other something on the part of the individual dentist which we call "operative dexterity" than on all the amoebacides, succinimides, and goodness knows what else.

To sum these things up:

The master minds of our profession; the men who have spoken to us with the voices of authority during the last quarter of a century, have created for us and for the public what is virtually a new profession.

Having done this, and plainly shown us the way to higher and better things, they have assuredly done enough.

Let us each strive to do our part in absorbing from them the fullest possible measures of knowledge and inspiration; but let us never lose sight of the stern fact that nothing whatsoever that can possibly come to us from sources outside ourselves, can ever, in our daily professional work, take the place of, or act as a substitute for, our own clear thinking, definite decision, courageous initiative, and skillful procedure.

Let us go on, learning from every possible source, more and more of the basic laws on which modern practice is founded, but also let us hold steadily in mind the ultimate fact; that all these, science, discovery, method, teaching and what not, are of value *only* when we as individual workmen pass them through the refining fires of our own experience and observations, and apply them with discrimination and intelligence to the case of the individual patient who is solely dependent on the knowledge, honesty, ability and craftsmanship of each one of us for relief from suffering and deliverance from personal affliction.

THE MATRIX—ITS CORRECT USE. A SUGGESTIVE TREATISE.

By Dr. W. A. Ivory, Philadelphia, Pa.

In many instances, to crown a tooth is the only alternative, but that too many teeth are crowned must be admitted, and with this assurance to further our claim, that by the proper use of the matrix large restorations can be made with amalgam that will bring more lasting results and a deeper feeling of pride to the operator than by crowning—this is the object of this paper.

It is not always the simplest thing to apply a matrix to a tooth in order to secure all advantages possible with a view to the saving of that tooth, not the mere filling of it.

In many cases the band will be drawn by the retainer with the same tension against every surface of the tooth, but if the particular surface at the gingival line between the teeth at or beneath the gum line against which it is most important that the band shall fit is flat or concave in form, no amount of force exerted by the retainer will draw the band against such a surface and into the depressions so that it will resist pressure equally at each point.

To insert the filling without first adapting the band perfectly at this margin would mean failure to obtain one of the chief benefits of the matrix. It is here the foundation for the filling is laid, and should the surface of the tooth be uneven and any of the filling material be forced beneath the gum, there is no assurance that it can be entirely removed. The fear of doing this must be eliminated before the filling is begun, otherwise sufficient pressure will not be exerted with the plugger to adapt the filling to this margin, and a perfectly adapted band at this line greatly removes the difficulties of establishing a perfect finish.

To adapt the band to such a surface so that it will prevent the filling material from being forced beneath the gum, and to insure a perfect foundation for the filling, warm clear through a piece of any good temporary stopping large enough to fill the space half way between the teeth on one side, though this material should not be too soft. Place this between the matrix band and the adjoining tooth, using force toward the gum line. Do this alike on both sides of the tooth. If properly done the band will be pressed evenly against the tooth and into the depressions, so that in finishing, there will be nothing more to remove from depressions than from the protruding points. Care should be taken not to hold the band too tightly by the retainer, or there would not be sufficient band material to reach into deep depressions.

The cavity very often extending beneath the gums, the temporary stopping will adapt the band to such a surface without injury to the gum tissue and will force the band into the depressions, forcing the gum away without causing pain or injury to those tissues, and being wedged between the teeth it cannot easily be moved out of place, and should the band be forced too far into the cavity in placing this temporary stopping, with a warm, but not hot burnisher inside the cavity, next to the band, gently coax the band back to a perfect contour. Until this is accomplished the filling should not be proceeded with.

Temporary stopping possesses all the necessary qualities and is easily placed when it is once mastered. The stopping will yield a little under pressure while condensing the filling in the cavity, allowing the filling to extend slightly beyond the margin. It is vitally essential that this lapping of the margins be obtained at every point along the whole margin of the cavity.

The advantages of a matrix rest largely in the ability of the operator to always have perfect control of the band; to slack or tighten as the case may require, keeping the band always at just the right tension and the proper distance from the margin. This is important—as pressure is exerted by the plugger toward the floor of the cavity, it is the band, and not the plugger, that forces the material toward the margin, wedging the material between the band and the margin, thus securing the advantage of this superior force.

To condense the outer surface of the filling next to the band and in the corners of the cavity and the filling lapping the margins between the band and the margin, a set of three pluggers is devised; two serrated, flat-iron shaped—one for mesial and one for distal cavities—both small in size, for it is very important that these corners shall be pressed by the pluggers; and one oval point to press that part of the filling lapping the margins.

Too strong emphasis cannot be placed on the importance of pressing with the plugger, instead of burnishing that part of the filling which is in close proximity to the band. This is the margin carrying the greatest strain, and it is only for this part of the filling that these pluggers are designed. In no way must it be assumed that these are the only pluggers needed, but are only to insure perfect condensation of the outer wall of the filling next to the band.

By a careful directing of the force with these pluggers next to the band, the filling may be shaped at will. As the filling is built up the band must be gradually forced out closer and closer toward the adjoining tooth just at the point of contact. This contact point need not be broad, but the adjoining tooth must be forced away the thickness of the band by pressure of the plugger—always pressing toward the floor of the cavity. This gives rigidity to that important surface of the filling, and it will not be easily distorted nor changed in shape while removing the band. Furthermore, pressure toward the band would dent the band, leaving a rough surface, and in trimming this away the contact point would be destroyed. If this contact point is ever lost sight of, the value of the filling is in a large measure lost.

Force directed toward the band, in condensing the filling over the lingual and buccal margins, or using pluggers larger than those indicated, or without being careful to have the band at just the proper tension—any of these would force the band far out from this margin, drawing the band very taut and in a straight line, using up excess band material and making it difficult to force the band out sufficiently where it is greatly needed to give the filling the desired shape at the point of contact where it meets the adjoining tooth, for if considerable trimming were necessary after the band were removed, to give the filling the proper outline, one margin or the contact point is imperfect.

The first piece of filling material should be placed next to the band between the band and the margin at either the lingual or buccal corner so that it will extend slightly beyond the margin. If this cannot be done the screw of the retainer must be slackened a little, but not too much, as it should require some force to press the band away. It is important that the band be held at just the proper tension by the retainer, neither too taut nor too slack; the intelligence of the operator is the only sure guide for this.

It is here that the wedging force of the plugger is lost or gained, for with any sort or description of a band between the teeth it would be impossible to direct the filling toward the margin with the plugger; hence, if the band does not force the filling toward the margin, it were better that no band had been used.

This first piece of filling material is condensed, then, with the small oval plugger. If this corner at the lower margin of the cavity is not covered with the first piece placed in the cavity and condensed at that time, there is no certainty that this can be done afterward.

The flat-iron shaped plugger is indicated for the next piece, building to that already placed, as this cannot move. Building across this lower margin to the opposite corner should be done with the utmost care; each piece of material should be placed next to the band, using small pieces in order to make sure that the band is forced away a little and the margin lapped at every point.

If the lower surface of this cavity is broad, the foundation is more easily placed, but it is where this foundation is narrow that the importance of wedging this first piece becomes apparent. It is in cavities of this kind that the matrix becomes as indispensable for gold as for amalgam. This is the foundation of the filling, and marks the point where most failures occur.

To cover the next margin, the band must again be slackened just enough to allow its being forced away sufficiently to permit a small piece to be wedged again between the band and the margin with the oval plugger, as over the first margin. This yields a little excess of band at each of these margins and creates space for the plugger to press the material covering these margins; otherwise it would too easily crumble away when removing the band. This also gives a little excess of band material and allows the band to be pressed out sufficiently just at the point of contact to meet the adjoining tooth, assuring a close contact.

If the cavity extends through to the opposite side of the tooth (an M. O. D. cavity) the band must again be adapted and controlled in exactly the manner as has already been described.

Any method of burnishing should be avoided, as this must surely flow mercury to the outer surface of the filling. Use the small oval plugger to wedge between the band and the margins, and a three-cornered plugger for those corners, and next to the band, throughout the operation, always pressing toward the floor of the cavity. Every part of the filling must be pressed alike by the pluggers, thus insuring a homogeneous mass.

The filling should be built into the cavity so that at every point along the whole margin there will be a little excess material to remove just over the margins. All the outer surface of the filling except just over the margins, and especially that involving the contact point, must be finished as the filling is built into the cavity, so that when the band is removed this surface is perfectly smooth, with no further operation necessary than to polish at a subsequent sitting. If it were possible to pass anything between the teeth after removing the band from an amalgam filling without removing some of the filling, (unless a separator were used) there could be no claim to having a contact point.

To sum up, the following successive steps should be observed: The band at the lower gingival margin between the teeth should have the same resistance to force at every point alike, no matter how uneven that surface may be; keeping the band at the right tension against the buccal and lingual margins by utilizing the screw force of the retainer; not allowing the band to be forced too far away nor drawn to closely to these margins, but always maintaining a working space for the plugger between the band and these margins; and after properly placing and condensing the first piece of the filling material between the band and the lingual margin, that it would be impossible to place a like amount between the band and the buccal margin without slacking the band; and that the same principle must obtain at the other two margins were it an M. O. D. cavity; of being certain that the adjoining tooth is forced away a little more than the thickness of the band just at the point of contact, for to have the operation at all worthy there must be a close contact with the adjoining tooth; that to use any method of burnishing not only leaves a weakened outer wall, but is one of the chief sources of difficulties in removing the band.

Any metal that will stretch is not indicated for the matrix band. To depend upon the metal stretching sufficiently in order to place material over the margins to properly cover them and maintain a close contact with the adjoining tooth would not be a sure method of procedure. Such a metal, too, would be easily dented, and the outer wall of the filling would not be left smooth.

Steel is recommended for the matrix band, maintaining a perfect working space for the plugger between the band and the margin and sufficient band material to insure a close contact by regulating the screw of the retainer as has already been stated. As steel is not easily dented, it need not be necessary to remove anything from the filling to establish a smooth surface at the point of contact.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held in the University Building, Tuesday evening, April 18, 1916.

The President, Dr. F. B. Moorehead, in the Chair.

Major G. E. Meyer, D. D. S., R. A. M. C., Oral Surgeon of the Twenty-third General Hospital of the British Expeditionary Corps of France, gave a lantern talk on the subject, "Incidents in a Year of Service as Oral Surgeon of the Chicago Hospital Unit with the British Expeditionary Force."

DISCUSSION.

Dr. Owen E. Cassill:

(Relating some of his experiences while serving for several months on the American Ambulance Service in Paris said:) I deem it a pleasure to tell a few of my experiences, and I am grateful to the Committee which gives me this privilege, and I am grateful to Dr. Brophy to whom I was referred when I made application to the Red Cross.

I want to say in the beginning that the pay I received is the same as that which I receive from you tonight except that our board and room were furnished. So I can be very frank to tell you right from the shoulder what I have to say. First, I would mention that one of the big things I learned there was through Dr. Potter, Professor of Operative Dentistry, Harvard University, and who was at the American Ambulance three months and at the Imperial School of Dentistry, Berlin, for the same length of time. He said that of the great nations now engaged in war Germany perhaps has given the most systematic attention to the teeth of its soldiers. He said also that they recognized fifteen years ago that to make good soldiers it was necessary that they should be able to chew hard food, and they set about it at that time, or went into the schools and began there to teach the children how to live as well as how to make a living. This, perhaps, has something to do with the great efficiency of the German soldiers today. It is only one little detail of how the people in Germany have carried out every point. I believe that a practical application might be made here of these and many other things, which were demonstrated.

I would refer you to the *Harvard Magazine,* the December number of which contains an article written by Dr. Potter, as testimony and support of the statements that I make.

I did not quite like the reflections that were made by Dr. Meyer upon the American Ambulance. In the American Ambulance there is the most cordial co-operation between the surgeons and dentists, and as evidence of that statement and testimony in support of it I will refer you again to the article written by Dr. Potter, in the *Harvard Magazine* on page 286 of the December number.

As further evidence in support of the statement as to the co-operation of the surgeons and dentists I refer you to an article in the *Journal of The Allied Dental Societies* of New York, published at 140 West 57th Street, New York City, in which this same point is again brought out. I do not think that it is fair to reflect upon such a gerat institution as the American Ambulance, which is supported by American money, and which is giving such good training to American people, and which is impartial to every dentist. Nearly all the people connected with it are good Americans, except what are known as the human sewers, and these are people who have come from London to get out of the war and to work in the American Ambulance. They carry the dirt and grime that comes out of the hospital. The French people appreciate it and the American people appreciate it. I would not for one minute let the American Ambulance be pulled down; and whoever says that there is not co-operation between the dentists and the surgeons needs to investigate by consulting such authorities as Dr. Guilford, Dean of the Philadelphia Dental School, and Dr. Potter, of Harvard University, and then you will get the real truth about the things that are being done there. The hospital is carried on in the most co-operative way, and if an ordinary dentist like me can go there, get some conception of the work and be able to do a little there must be something to it, for I pose only as a most ordinary dentist. As Abraham Lincoln said "God must love the ordinary people because he made so many of them." What is true of this is true of dentistry.

When you come to the American Ambulance you will be treated most cordially. If you are capable of doing plastic surgery you will be given that kind of work to do. I want to say that the best plastic surgeons are not always oral surgeons. It seems that the esthetic ability of the French is wonderful and naturally fits them for this work of restoring facial features. You know and I know that all through the ages the French people have been known for their esthetic ability, and when it comes to sculpture and art they cannot be excelled. Is it not reasonable then to expect that these people would be by nature the people who could do the best plastic surgery.

I hope no one will go from this place believing that there is not co-operation between the dentists and surgeons of the American Ambulance Hospital. In connection with this as still further support I want to mention that the Chief General Surgeon, Dr. De Bouchet, is an American dentist and an American physician; that he is from a family of dentists; his father and brother were dentists, so he naturally has a good conception of the interdependence between dentists, physicians and surgeons. And let me tell you that the American Ambulance is the first military hospital with a dentist on its medical board, and that from it all the other hospitals have grown until now there are twenty-nine with dental sections, under the French government. Quite sufficient to do all the work and do it well.

Another big practical thing that I learned was the use of modeling compound other than for impressions. We used Detroit modeling compound for holding back torn tissue and to prevent the cheeks and lips from collapsing. It was found that the compound is very good to the tissues and it can be left for some time. Dr. Davenport said he had left it holding in place torn tissue as long as twenty-two days.

The French allow their wounded to go about the cities where they please. The Germans keep them secluded. This shows you the true temperament of the French people. The desire to do good and to get well quickly. There is no display about it. It is the simple life plan. Little attention is paid to uniforms or any other form of display.

Dr. Hayes, who is the Chief Dental Surgeon, is an American and one of the squarest and finest men you ever met, and Dr. Davenport is the same and all the other dentists. Dr. Guilford, Dean of the Philadelphia Dental School was there, and Dr. Potter, and myself—a little fellow of course—but they gave me a fair chance with the rest.

Now then I am going to tell you a little about the equipment. There are fourteen dental chairs, a large laboratory with six laboratory men working all the time and rooms for sterilizing. Every dentist has an assistant known as an auxiliary and over these is a head nurse. No charges are made for the work.

I believe you will agree with me that I have stated the thing plainly and frankly and squarely. I have not digressed one inch from the actual truth and it is my duty since I have gone away there and have been through the war zone, and have come back here to tell you what I have seen; and to have anyone depreciate even in a little degree the American Ambulance does not set well with me. The thousands of photographs that could be taken about the hospital would perhaps project the subject to you much better than I can do it, but if you will read your *Dental Cosmos,* it will put you wise to many of the things that are being done.

As for further reading matter in this connection and then I am going to close because I know you will not care to listen to me longer—I want to refer you to the *Outlook,* a magazine that is respectable and which is fit for anybody to read. Another magazine I want to refer you to is the *Humane Society Magazine,* translated from French to English, the December number. Get that if you want to find out something about what the American Ambulance is and has been doing for even dogs and animals.

I hope that I have made this strong. (Laughter.) That was why I went to join the American Ambulance and Red Cross in preference to others, to be independent, to be independent of everybody. I do hope that you will look up the references in support of what I have said.

I thank you very much. I could go on and tell you a lot more about the courtesy of the French wounded. About how the patients treated us, about how they were anesthetized, about how a simple fracture is more easily treated than a lower second molor with a caviety on the distal side, actually true, and many other good things. I do not suppose I will ever have the honor to get up here again. But you know, the ordinary fellows once in a while do get up. Since I got up, I thought I would put it at you good and strong. You must believe what I have said and if you do not believe it is so, please look it up and read it for yourselves from men who are authorities. I thank you. (Applause.)

Dr. Meyer (in conclusion):

I hope that you did not understand me to say anything that would reflect against the American Ambulance. I cannot begin to tell you of the beautiful work I saw there, but what I said tonight is the truth. I gave this same little talk to the American Dental Society in Paris, and Dr. Davenport and Dr. Hayes said that is just the thing we want you to tell to the boys in Chicago. I hope Dr. Cassill did not think for a minute that I was saying anything which would reflect against the American Ambulance, because Dr. Hayes and Dr. Davenport have given up their practice, and they are working for nothing in this place, and as I said before, they are doing wonderful work. I saw more pictures there and I saw more models than I saw in any other place. They had time to take pictures there, and they had wonderful pictures, too, and I want to say that there were a very few pictures of my cases that I got. I worked night and day. What I said about the surgeons—the surgeons are doing the plastic work in the hospital and the dentists are doing their part, and they are getting along beautifully. What I said about the disagreement was in the French hospitals, and they are so strong that at Valdegruf they have made an arrangement with the American Ambulance to bring their patients to the surgeons in the American Ambulance to be operated upon because of the fact that the surgeons and the dentists cannot get along together. The French dentists will not consult with the surgeons, and I hope that you will go away this evening and not think that I have reflected on the American Ambulance at all, because it was wonderful work that I saw there; and I will tell you right now that the American Ambulance ought to have more support; that is, the dental department, than it has. Dr. Davenport and Dr. Hayes told me that if there was any way of getting more money for the dental department that it should be done, because, while the rest of the hospital was getting everything, they came in on the tail end of it.

Another thing I want to say, in the places I visited on this trip, that the first place that they usually escorted me to was to the oral surgery, where I could see what was being done. And I hope that Dr. Cassill did not think for a minute that I was reflecting in any way on the American Ambulance. I thank you. (Applause.)

ILLINOIS STATE DENTAL SOCIETY, FIFTY-SECOND ANNUAL MEETING, HELD AT SPRINGFIELD, MAY 9-12, 1916.

DISCUSSION OF THE PAPER READ BY DR. ARTHUR G. SMITH ON "THE CASE OF THE INDIVIDUAL."

DR. E. K. BLAIR, WAVERLEY:

Mr. President and Members of the Society:

The paper to which you have just listened is especially interesting from many standpoints, but none more than the manner in which the writer deals with the relationship of the operator to his patient.

In these days of hurry and bustle, with the attainment of maximum yearly records one of the chief objects in view, man is too apt to forget that a reasonable time for consultation is the real sine quo non of a properly conducted dental practice. A heart to heart talk, based upon an intelligent knowledge of the real scope of dentistry as a creative and preservative art, coupled with a considerate regard for the comfort and welfare of our patients and liberally transferred with the milk of human kindness will insure to those who appeal to us professionally the greatest degree of comfort and a maximum of skillful service. Without a thorough survey of the field we may commit the most inexcusable errors, and frequently, discourage our patients from further efforts.

After having reached an intelligent understanding of the requirements of the case there will be ample room for the application of whatever skill and knowledge we may possess. The writer has truly said, "We should be good judges of human nature." In dealing with patients who are undergoing their first experiences in the operating room, a first aid to success is the widespread teachings of the profession—urging prophylaxis—mouth sanitation and the preservation, not the destruction, of the teeth.

One cannot fail daily to observe that the public in general is rapidly drifting into the belief that taken in time the major portion of diseases of the mouth may be eradicated and caries of the teeth arrested. In fact in some instances we find those who, considering the conditions present in their special cases, are expecting us to almost perform miracles. "I lost my teeth from lack of early attention" is a common expression, and "Had I consulted the dentist my irregular teeth could have been made presentable" are statements we often hear. Right here lies the crucial test as we endeavor to apply "the thoughtful care of the patient," suggested by the essayist. It places us where we must hasten slowly in changing the position of firmly imbedded teeth and where we must have recourse to pain obtrudents at our command. We owe much to our worthy president for his contribution to our omountonum—the Densensotizing Posti. It will carry us safely through many a trying situation and help to establish the most pleasant relationship betwixt patient and operator. Time occupied in its application is well spent. I know of no evil effects from its use and the benefits derived have been far reaching. Dr. Smith's paper is a worthy contribution to our program. It is well to view the situation from the patient's standpoint—'tis better still to undergo a few operations upon your own teeth. There is nothing that clears up the mind of an operator so thoroughly as putting himself in the patient's place. For many years people were taught to withstand pain and urged to regard such heroism as essential to success and hence right and proper. Now each day brings forth additions to the ranks of those who proclaim the doctrine that if we exhibit a proper regard for our patients we will avoid all painful procedures. Coexistent with the demand for painless dentistry, produced either by general or local anesthesia, is the growth of public sentiment which becomes more exacting each year, requiring a greater degree of permanency in our work.

Reflect a moment. He who measures up to the standard and fulfills the requirements of the hour—judged by this double test is neither novice nor unskilled—but the master of both knowledge and technique. Confronted almost daily with the widest variations in temperamental conditions, brought face to face with the most trying and difficult problems, his efforts are in a large degree crowned with success. Another victory for a profession upon whose banners has been permanently inscribed the word progress. Not progress that is attained at the sacrifice of the patient's welfare and comfort, but that genuine advancement which is the outgrow of a profession commanding the respect and admiration of intelligent people the world over.

It is a pretty compliment that the essayist pays to those who struggled in the early days amidst discouraging conditions. It is a pleasure to recount their achievements and devotion to the profession, but there is need also of expressing our appreciation of the great men of the present day. They are legion and we may with confidence put into their hands the problems of the future. If I may be pardoned one suggestion to these present day practitioners I will urge that though it may seem wise to specialize—it is more wise that we keep in touch with the whole field of dentistry as near as possible, if for no other purpose than properly diagnosing the cases presented as very general knowledge is desirable if we serve well our patients. This comparatively new subject introduced by the essayist should be generally discussed. An hour of the time of this society devoted to it is time well spent. In spirit it is a clear manifestation of the disposition of this up-to-date practitioner to view from every angle the problems demanding solution daily in the dental office. As practitioners we are compelled by force of circumstances to urge prompt appearance of the patients at the hour reserved for them on the appointment book, we adhere closely to our views as to the treatment required for each case presented. In many instances the fee charged for the service rendered is ample and it is but just and proper that we should convincingly prove that we have a supreme regard for all who commit themselves to our care.

There are many distressing and disagreeable experiences which can, wtih tact and skill, be avoided, and we as operators will find solid comfort when we reflect that we have without lessening the value of the operation contributed to the happiness of our patients.

The future has in store for suffering humanity the amelioration of much, if not all pain. Up-to-date the dental profession has contributed more than its share of the potential anesthetics.

Let us hope that as scientific investigators it may continue to excel.

DR. EDMUND NOYES, Chicago:

It seems to me that this is a *very good paper;* however, when the essayist says that "twenty-five years ago our profession began to emerge from the conditions which had, up to that time, surrounded it and largely influenced its hitherto somewhat meager development," I am disposed to doubt whether the date of such emergence can be set so definitely. I have often noticed that when men refer to the progress of the profession it seems natural for them to date the age of professional enlightenment at about the time, or a little previous to the time, when they themselves entered the profession.

I believe that such sentiments were very frequently expressed after the first organization of the profession in 1839 and 1840 by the establishing of the first dental society, the first dental journal and the first dental college. Previous to that time "Every practitioner was very largely self-taught." Dentistry had no professional *standing,* and what professional *character* it had was given to it mostly by medical men practicing dentistry. The others were most of them empirical mechanics and nothing more. Again in the early days of this society men were heard to congratulate themselves and the profession on the fact that the days of dental empiricism were past and dentistry was now become a scientific profession. In reality the substitution of established facts and scientific deductions for clinical observations and empirical opinions in the field of dentistry has been a very slow accomplishment, and nothing can be truer than the statement of the essayists that "the line of advancement has seldom, if ever, been straight and direct, but far more often wildly erratic and zigzagging; rushing now to this side, now to that, of the final course where safety and sanity were ultimately found to lie."

As examples, witness the "Amalgam war." The Arthur plan of separating teeth to prevent proximal decay, and all the vagaries of the "New Departure." All this is only preliminary to what the essayist really has to say to us. What the essayist calls method might be described also as the standardization of all dental operations and procedures.

Formerly there were fewer recognized standards and men were *forced* in a greater number of cases to depend upon their own judgment and experience. Now every young man comes out of school having had theoretical instruction and some practical experience in a *method* of doing everything in dentistry in a way that has, at least in his own mind, a scientific basis, or the authority of teachers who represent the opinions and practices of the profession, and he *may* go into practice tied hand and foot to the methods he has learned, applying them in exact and routine fashion to every case that comes along. His intellect may have been so closely directed to a multitude of details that his judgment has remained dormant. Paulsen, in his System of Ethics' states this case in a striking way. He says, "To know too much for his capacity makes a man not wiser, but more stupid. We must discriminate between stupidity and ignorance. Ignorance is a lack of knowledge; stupidity is a lack of judgment, and may go with great learning. Nay, it may, under certain circumstances, be due to this. A good anecdote is told of the Duke of Wellington. A young man once applied to him for an office. After conversing with him for a while, the Duke refused his application, adding, "Sir, you have received too much education for your brains."

The essayist has made his plea, better than I can, for the study of individual cases and the exercise of judgment as well as knowledge and skill in the treatment of them. It is especially necessary now, since the more definite knowledge and better realization of the causative relation of mouth infections to systemic diseases urgently call both for a broader knowledge and a better trained judgment than were formerly required.

I have reason to suppose that the dental schools, at least some of them, require of their students a very rigid compliance with the rules and methods prescribed by the school for the infirmary practice, as, for instance in the preparation of cavities for fillings, the choice of materials, and the operations and procedures generally for the treatment of the natural teeth; perhaps also in the prosthetic department. This is undoubtedly necessary, for students cannot have acquired sufficient experience and judgment to allow them much liberty of individual judgment and opinion with safety to the infirmary patients. However, it is very desirable that they have some opportunity and training in the exercise of their personal judgments and opinions. It seems to me this might be accomplished by requiring them, in the last half of the senior year, possibly sooner, to make an independent examination and diagnosis of their cases without knowing the diagnosis previously made by the demonstrator, and requiring them to explain why the entire method prescribed by the school is applicable in the particular cases, or why, in other cases, the usual methods should be modified, or why they should be ignored and other methods substituted. Perhaps this is done in the schools. I should imagine it may be.

Dr. J. F. F. Waltz, Decatur:

To briefly summarize the paper under discussion we find Dr. Smith mentions the earlier conditions of dental practice when each practitioner was more or less given to a personal system of practice, the result of his observation, reflection and experience, methods he had developed largely alone and which he came to feel were his sole possession, to be guarded carefully as would be ownership of any personal property. Under such conditions progress was necessarily slow. The gradual change from these earlier conditions to those of today is traced, and emphasis put upon the complete reversal of former conditions of practice until we now have a science and literature of dentistry well developed and instead of isolation of the practitioner a fine fellowship exists banding us together into ever closer relationships wherein we all share the newer developments of our science and assimilate more thoroughly the accepted methods. Probably nowhere can the present conditions be better exemplified than in Illinois where through the agency of our state and component societies the remotest individual practitioner has had contact with the most advanced methods and ideas until these methods are partly his, or he feels under stress of mastering them until they are his own.

Dr. Smith mentions the zigzag course of progress in contrast with the straight and narrow path from facts to true conclusions. I wonder if the rank and file of dentists are as subject now to the influence of fads and new apparently worthy ideas later found wanting, as they once may have been or now may appear to be. It seems to me there is a decided disposition on the part of many at present to discount liberally the glowing promises of the new method or idea, in a word there is a conservatism which bids us accept the new only when it appears proven and worth while. Perhaps I am only personally a bit more mature, but I distinctly feel it is not as true now as it once may have been that the new idea stampedes our profession. For example the recent discovery of emetine and its effects, launched upon us as it was, very rightly put us in a state of expectancy but nowhere was its merit credited except in such measure as it seemed proven in practice.

To proceed with a summary, the paper sets forth the gradual establishment of standards at practice based upon scientific principles and then points out how worthless standardized methods are in themselves, that until they may be intelligently interpreted and applied rightly to the patient they confer no actual benefit. Stress is put upon the need that the practitioner study his patient's case to the fullest extent and then make application of the method which in his judgment best solves the problem presented.

This is the nub of the entire paper and its importance too often impresses those of us who are earnestly striving daily to serve our patients in the manner we would want ourselves taken care of if possessed of the patient's condition. I wish Dr. Smith might not have felt quite so serious over this subject for otherwise he might have injected something into his presentation which is entirely lacking, a flash now and then of his rare faculty in expressing humor and wit with which those of us in central Illinois know him so well endowed. Yet how can one be otherwise than serious as time and again we see a patient's interests sacrificed to an idea which some dentist has misapplied so grossly as to constitute real malpractice. All of us err in judgment and always will, but such errors are not made daily if we possess any fitness as dentists. A careful and intelligent application of proven practice to the individual case requirements should be the rule far more universally than seems true. By this is not meant we should all be necessarily brilliant in every bit of work performed—such is not true in any line of human endeavor—but instead there should be a much more earnest care of the patient's best interests, less evidence of haphazard and indifferent concern of the patient's good. Much is said nowadays of under compensation for dental services but in many such discussions less emphasis is placed upon high grade service—the patient's best interests—than is given the increased fee. Many instances there are of dental services in mouths where it would have served the patient better if the fee paid had been given for *not* performing the operation. Let us discuss adequate compensation under no circumstance apart from adequate service.

Commonly observed evidences of shortcoming to fairly consider the "case of the individual" are the great prevalence of ill-fitting, grossly unsanitary bridges and shell crowns. It seems to me as many as nine out of ten bridge appliances observed in mouths as they come to our offices should never have been made—not because of a quibbling attitude but because few dentists would permit such misapplication in their own mouths! Slight observation will condemn the practice of mutilating and devitalizing one or more sound or practically sound teeth to supply one or even two missing bicuspids or molars when otherwise the mouth is in good or normal masticatory condition. Bridgework is a well proven method of supplying lost teeth under certain conditions, hence the practitioner must bring a balanced judgment to bear in considering those conditions else the patient is sacrificed to methods which Dr. Smith emphasizes should not be.

Again and again are operations made upon the teeth and the gum conditions of gingivitis due to salivary calculus are neglected apparently as though they were of slight importance, whereas nothing short of relief of pain is more for the patient's good than that gum conditions should be made normal if possible. Further, in filling operations often have a patient's best interests been made secondary to a "system or method" fixed in a bigoted sense in an operator's mind when that operator may have subjected his patient to several sittings and have placed an indifferent gold inlay when a better plan might have wrought a more durable amalgam restoration with less nervous tax upon this sensitive patient in less time and less severe sittings—another instance of the patient being fitted to a method instead of methods being adapted to the individual case.

It is certain Dr. Smith's paper well states a condition needing correction perhaps as much as any in our calling and reflection upon the points it presents may likely enough prove the greatest real good each of us shall gain from this session's program.

Dr. F. B. Clemmer (Morgan Park, Chicago):

This paper, to me, strikes the keynote of dentistry. I have been interested in this man ever since two or three years ago I heard him talk about "Bringing home the bacon for the children" down at Peoria. I take it that the consensus of his remarks is based on this one thing—how can we give the best in us to the individual who sits in our chair and accepts our ministrations?

And I take it he is making the plea that we give to that patient everything our best judgment tells us we should, irrespective of fee. I also take it that the thing that is the greatest force in dentistry is the motive back of the work. I care not how skillful a man may be, or how zealous in his profession, if he does not consider the motive as the predominant thing he is injuring his patient. And conversely, no matter how bad his work, if he is doing what is to him an absolutely honest piece of work, that work is worthy of commendation.

Dentistry—I speak carefully—is the grandest profession before the public today if it is exercised rightly. It offers the greatest opportunity to men to put their best motives back of their work, and the man who does not do that soon becomes a charlatan. The individual who sits in our chair is greater, for the time being, than the dentist who stands by it, and we must give that person thorough consideration. I have great respect for the physician, but he is no greater than the dentist. The word "doctor" means "teacher,"—and we should *teach* the people what is best for their mouths according to our standards. Sometimes people will sit in the chair, and if you watch them carefully you will see they are taking mental note, and you think, to quote from Burns,

"Oh, wad some power the giftie gie us,
To see ourselves as ithers see us!"
It wad from mony a blunder free us,
And foolish notion."

I remember reading a poem by J. G. Holland, "Bitter Sweet," in which he says:

"Heaven is not gained by a single bound;
We build the ladder by which we rise
From the lowly earth to the vaulted skies,
And we mount to its summit round by round."

I count this thing to be grandly true
That a noble deed is a step towards God,
Lifting the soul from the common sod
To a purer air and a broader view.

The dentist has that opportunity, and if we as dentists look upon the idividual in our chair who is asking our consideration and help—if we can help him to a better understanding of what is in his mouth, we are lifting that soul from the common sod to the purer air and a broader view.

Dr. Arthur G. Smith (closing):

I would be indeed lacking in all the deeper and finer feelings that a man can have if I did not feel appreciative; if the best that is in me was not deeply stirred by the high level on which my humble effort has been considered by men so amply competent to consider anything that might be offered from this rostrum.

Humor has its legitimate place in the world. We cannot get along without it; none of us want to get along without it, yet I certainly do not wish any poor faculty that I may have along that line to prevent me from expressing as best I can those deeper and finer sentiments which should mainly concern each one of us when we come to the consideration of such problems as I have tried to present. I have been very much moved by the high plane on which my paper has been so ably discussed, and I want to thank the gentlemen for that honor.

Now, this paper was written at the chair; this paper was written as I pulled off bridges and crowns, and took out amalgam fillings and threw them into the junk pile. This paper was written to emphasize as best I could the hideous, awful, criminal discrepancies that exist between the illustrations in our text-books and the things that we take out of people's mouths.

Doctor Waltz hit the nail right squarely on the head when he said that many times the patient had better have paid the man the same fee to do nothing, rather than to do what he did. That did my soul good.

Well, gentlemen, there is not much left for me to say. I consider it enough to give any intelligent man pause to be asked to present anything worthy of the consideration of this body. I thank you for the privilege.

THE DENTAL REVIEW.

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE RAW RECRUITS.

This year the dental colleges of America probably have the largest number of students entering the freshman class that ever convened in the history of dental education. There are two chief reasons for this—the growing importance of dentistry as a profession, and the fact that this is the last year in which students may enter college and be graduated in three years. The attention of the public at large is being more and more directed to the importance of dental service, and this has led many young men to turn to dentistry as a vocation. This is desirable in many ways provided, of course, that the young men are of a desirable class, and we feel very sure that the majority of those who are entering today are of a better educational caliber than those who have sought admission in the past.

This is of the utmost importance if the standards of the profession are to be properly maintained, because there is no blinking the fact that too many of our young men in previous years have been admitted to college without the proper mental training. Whose fault this is we are not inclined to consider at this time—except to state that the universal charge that the entire fault lies with the colleges is not by any means tenable.

But the present question is—what are we to do with the raw recruits? At no time since the first dental college was opened has there been so grave a responsibility resting upon our dental teachers as there is today. This does not relate solely to the fact of a large attendance, though this of itself naturally increases the obligation due to the public to see that all these young men are properly trained to serve the public well—and, of course, as the numbers increase the problem increases. But of far greater significance is the changed mental attitude of the people toward dental service and the things that are required of the dentist. Today a practitioner must be able to do something more than merely fill, extract, regulate and insert teeth. He must be prepared to meet face to face with the practitioner of general medicine and consult with him on an intelligent basis. He must be able to recognize the intricate relationship which may exist between tooth infection and systemic disorders. He can no longer isolate himself and remain *sui generis.* He belongs to the great healing art, and must so prepare himself.

With this as our point of vision, the present enormous classes in our colleges assume the proportions of a problem. They loom large in their possibilities for good or otherwise, and it is well for our teachers to recognize at this time their full responsibilities in the matter. The raw recruit should be coached most carefully from the day he enters college till he leaves, and he should be taught something beside the technical part of his work. More and more the teacher needs to aim at making a broadminded man of his student rather than a mere memorizer of phrases, and formulae, and theories. And it is really one of the most satisfactory features of college work to see these same raw recruits round out and mold into efficient men after their three years training. We hope it may be better when the four-year course is in operation, but the present problem relates to taking these freshmen of 1916 and doing for them in three years what should really take four years to accomplish. Nothing is impossible and if our teachers enter on the problem in the proper spirit they will send the present classes out three years hence not only greater in number but better prepared than any of their predecessors. *"Right about, face; forward, march!"*

THE EDITOR'S DESK.

MY PERSONAL TRIBUTE TO THE LATE DR. L. P. HASKELL.

I had known Dr. Haskell for thirty-two years, and in some respects he was the most remarkable man I have ever met. His was the common lot of most men, to be buffeted by fate at times, and yet, I never knew him to be anything but cheerful, hopeful and complacent. What other men took as a reverse he accepted as merely an incident in the day's work. Out of his inner consciousness there never emanated the miasma of doubt, or distrust, or envy. He did not know how to hate. He attacked wrongs at times but never men, and in the alembic of his mind there never brewed the dregs of rancor.

He was one of the greatest optimists in the dental profession, and never in the darkest days of his ninety years of life was the light ever obscured from his point of view. As the span of man's age is measured, he had been old for years, but in his mentality he was ever young, and looked more toward the future than to the past.

He was favored physically, having come to his old age with few ills. His characteristic remark, when asked by a friend how he felt, was always: "The old craft is still afloat—timbers all sound—and no prospect of going into dry dock for repairs very soon." He never knew what it was to have a "cold," and when I talked with him at the hospital a short time before his death he assured me that it was the first time he had experienced an ache or pain in twenty-five years. Truly the machinery was tuned to run well and smoothly.

Maybe after all the mentality has much to do with the physical balance, because this man's mind was normal, serene and healthful always. The only complaint I ever heard him make—and this was more a lament than a complaint—was in his later days when his failing sight had incapacitated him for work. To be deprived of work was the greatest hardship he ever suffered. He said to me frequently: "To be obliged to sit around and do nothing is the hardest task I ever performed." But even this was said with a smile.

It had been his prediction to me many times that he would probably go to his office regularly and attend to his usual duties till suddenly the machinery would run down and he would never go again. He hoped to die in harness, and while this hope was hardly realized, yet he was mentally alert to the last, and died like a good soldier with his face toward the front.

His immediate friends will miss his pleasant personality, but his influence for good in his profession will last longer than personality, because of what he has said in the lecture room and what he has recorded on the printed page. His memory will ever remain a sweet savor with those who knew him well, and this in the ultimate is the most and best that can be said of any man. Hats off! A requiem for the Old Roman!

MY LETTERS.

I have a very large correspondence and some of my friends commiserate with me on what they call "the burden" of answering letters. But they don't know. The fact is that the motive behind most of my correspondence is selfishness—selfishness on my part. It is a selfish way I have of visiting with my friends. The world is so large now, and my friends are so scattered, that I find it impossible to visit with all of them by word of mouth, and so I take this means of keeping in touch with them. Next to the pleasure of seeing my friends personally is the great joy I have in receiving letters from them. I know of no more satisfying thing, in a way, than to sit down at my desk after a hard day's work and look over the letters my friends have been kind enough to write me. It refreshes me and makes me feel that life is worth the living. There is an individuality in each letter, and I read each in a different mood. Some of them are from friends I have known for years, some from recent friends, and some from friends I have never seen. All are interesting. I read the letters from friends I know with a mental picture of the writer before me as I read. I am actually visiting with him, and if the hours of the day were longer—or rather the hours of the night, because all my letter-writing is done at night—I would answer him back in a better way than I usually do (which is really no excuse at all, and I trust I am properly ashamed of it). I read the letters of the friends I have never seen with an imaginary picture of the writer, and some of them I am sure would smile if they knew the image I have of them in my mind. As I read these letters I often imagine the writer a perfect deity—which of course is ridiculous.

The character of the letters I receive is as varied as are the writers. Some of the letters tell me of good fortune, of happiness, of hearts lightened and hopes high. With these I rejoice. Others tell me of disappointments, discouragements, and the blasting of hopes; and with these I sympathize. Some bring me word of bereavement and sorrows, and I mourn with these. Others tell me of domestic events, and particularly the arrival of babies. When one of these letters comes I instantly drop everything and write a note to the new baby. I have the distinguished honor of writing the first letter that many a baby has received, and while it has probably made little impression on the baby, yet it has done me worlds of good.

Very many of the letters I receive contain an appeal from some member of the profession for information on a problem or case that has puzzled the writer, and it is then that I feel my ignorance most keenly.

Some of the pleas in the letters that come to me are unique, ranging from a request by a man I had never heard of to draw some plans for his new office, down to an offhand suggestion by another that he would like a full partnership in my practice. One man—bless his heart—honored me with a recital of his whole life history to the most minute detail, till I blushed and blushed at the confidences he reposed in me. I have many times since then wished that I might have the privilege of meeting that man. I confess to a real womanly curiosity to see what he looks like.

And so it goes. In the quiet of many an otherwise discouraged and weary night I refresh my courage and my hope by communing with my absent friends. I am rested when I rise from my desk to go to bed—rested mentally and physically; and as I place my head upon the pillow I lift a benison for all of those who have been good enough to send me letters.

BOOK REVIEWS.

CROWN AND BRIDGEWORK. By *Frederic A. Peeso, D. D. S.*, Director of the Dental Graduate School of the University of Pennsylvania. Octavo, 456 pages, with 752 engravings. Cloth, $5.00, net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

The name of Peeso has been so long and creditably known in connection with crown and bridgework that it is merely necessary to mention the fact that he has written a book on the subject to insure its hearty reception on the part of the profession. The present volume shows most careful preparation by a man who knows thoroughly what he is writing about, and who has a vivid way of illustrating what he is trying to describe. A very wise precaution has been taken by the author in the early part of the work by emphasizing the necessity for great care in properly preparing the roots for the reception of crowns or bridges, and with this as a stable basis on which to work, the book is built up in a logical and normal sequence. It is a pleasure to commend a book when both author and publisher have combined so successfully in perfecting it.

DENTAL ANATOMY. By *Martin Dewey, D. D. S., M. D.* Professor of Dental Anatomy and Orthodontia, Kansas City Dental College; President of the Dewey School of Orthodontia, Kansas City, Mo. With illustrations. 291 pages. Published by C. V. Mosby Company, St. Louis, Mo.

The study of this important subject is greatly facilitated by the appearance of this book. Dr. Dewey has brought much painstaking care to the problem of furnishing a book which shall aid the dentist in his practical every day operations. This is particularly true of pulp canal work, the illustrations of pulp forms being more complete than any we have ever seen. In a subsequent edition we would suggest a slight revision in some of the nomenclature, such, for instance, as the use of the word "canine" in connection with the cuspid tooth. We believe it is full time that this word was eliminated from our literature, and we can see no good reason for its retention. But this is a minor matter which does not detract from the great value of the book as an aid in the study of the subject. In this, as with other works by the same house, the publishers have issued a splendid volume, well printed and clearly illustrated.

WHO'S WHO IN DENTISTRY, Biographical Sketches of Prominent Dentists in the United States and Canada. Edited by *Samuel Greif, A. B., D. D. S.* 238 pages. Cloth. Published by Who's Who Dental Publishing Company, New York.

This is the first attempt to publish in a single volume the biographical sketches of the prominent dentists in the United States and Canada, and the author is to be commended for his efforts in placing before the profession authentic data regarding many of the men who are helping to build the profession in these two countries. As with every new work of this kind—the difficulties of such a task can be appreciated only by men who have been engaged in similar effort—there is the inevitable lack of true proportion in some of the sketches. Then there are omissions of men who are fittingly entitled to a place in such a work, for instance, that of the late Dr. L. P. Haskell, whose name has been before the profession for more than half a century. But such discrepancies will doubtless be remedied in future editions as the editor gets a more perfect grasp of his work, and we wish him the greatest measure of success in the continuance of his efforts. It is proposed to bring out the work triennially after an enlarged edition has been issued late in 1916.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Repair a Perforated Root:—Of course it is always the other fellow who drilled the hole in the root, but never mind, just put a little of the gutta percha which you use for filling roots over the place and go ahead.—*James W. Cormany, Mount Carroll, Ill.*

Preparation of Soft Tissues Before Extraction with Local Anesethetics:—When treating the gums with solution of iodin previous to injecting for extraction, always apply well round the gingival margin, this prevents any septic matter there being forced into the tissues when applying the forceps.—*A. G. Salisbury, Takaka, N. Z.*

Refitting Temporary Dentures:—In some cases temporary plates may be refitted by cleaning and freshening the palatal portion. Then covering with a piece of vulcanizable gutta percha which has been warmed in water of about the temperature used for modeling compound. Use this as an impression material. Chill in cold water. Trim and repeat until you have perfect adaptation. Flask and vulcanize.—*F. A. W.*

Grinding the Cusp to Prevent the Lodgment of Food:—In some cases we will find that fibrous food will wedge between teeth even where the contact point is good. In these cases take a bite in modeling compound and pour a model. It will usually be found that the opposing cusp impinges in a sharp wedge-shape so as to spring the teeth apart at each occlusion. The remedy is to grind the sharp cusp to flatten it somewhat, which will usually bring instant relief.—*Ed.*

Wax:—About the size of a walnut placed in a tray and used as first form for the heels of an impression enables the operator to carry the plaster more perfectly to the back of the mouth with little risk of trouble in the throat. After the wax has been pressed to place in the first trial plaster is then put in tray and a portion in the roof of mouth and then the insertion of the tray with well distributed plaster-mix will give a fine impression.—*Grafton Munroe, Springfield, Ill.*

Non-Corrosive Iodin Broach:—A very useful broach or carrier of iodin preparations is made by taking a strip of ordinary aluminum plate about two inches long, cutting it into strips a little wider at one end than its thickness, tapering it to a blunt point at other end, file edges rounding and insert large end into broach holder or split stick. Wrapped with a little cotton or plain, it makes a splendid instrument for carrying iodin preparations into pyorrhea pockets. Being flexible it can be easily bent into best possible shape to reach any pockets. Wrapped with larger quantity of cotton makes a splendid swab. The iodin will not corrode the aluminum, making a cheap and useful instrument.—*P. A. Pyper, Pontiac, Ill.*

Removal of Rubber Dam:—In removing the rubber dam from teeth that have just been filled with silicate materials the surfaces of which have been covered with wax or varnish, the procedure is as follows: Clip ligature with fine, sharp-pointed instrument as near the filling as possible. This is done to facilitate the removal of the ligature and to insure pulling the least possible amount of ligature endwise past the gingival margin of the filling. Then, drawing rubber dam away from necks of teeth by pulling at right angles to the teeth until the holes become plainly visible, take small scissors and nip each segment of dam which passes between the teeth. The contraction of the segment will cause it to be withdrawn from the interproximal space, and permit final removal of dam without the silghtest interference with wax or varnish covering filling.—*D. N. Lewis, Lake Forest, Ill.*

Gold Plating in Dentistry:—Pure gold next to porcelain and pure platinum is the least irritating to the oral tissues of any of the restorative materials used in reparative dentistry. Bridges and gold plates are usually made of alloyed gold. However, lower karat than 18 karat, high grade gold solder should never be used in dental prosthesis. In many mouths, the oral secretions and gases act readily on alloyed metal and it becomes unsightly and unclean, besides often causing a disagreeable metallic taste, which is augmented if there are alloy fillings in some of the remaining teeth.

It is my practice to gold plate the piece after it is thoroughly finished and highly polished before placing it in the mouth, this can be done in various ways but the method to use now is a very simple one, using the Orvis Perfected Gold Plating Solution which can be purchased at any good dental depot. Follow the directions closely, being especially careful to thoroughly cleanse the piece before immersing it in the solution. The finished piece will plate beautifully and the results are most gratifying.—*G. Walter Dittmar, Chicago.*

Packing Rubber Plates:—Take piece pink rubber four thicknesses for medium thick gums, five thicknesses for heavy, fold rubber on itself, be sure no air spaces are between layers. Make it whatever height you want plate by measuring height of gum wanted with calipers, then measure length from first molar on one side to same on opposite side.

For red rubber make a roll about two-thirds the size of a lead pencil. If for diatoric teeth cut small piece rubber and pack in hollow of tooth first. Take roll of red rubber, start at second molar, run around to same on opposite side. Pack under all pins first so as to be sure they are seated in red rubber. Take an instrument and pull rubber back towards lingual surface from space between each tooth so there is no chance for red rubber to show through. Then take pink piece and stand it so that lower part rests on pins. Take thumbs and press all to place nicely, following up by pressing with an instrument between each tooth, so you have a uniform thickness of pink. Take flat end instrument and unite at joint both rubbers. Then take piece of red so as to back up pink allowing it to cover joint of other two rubbers. Then pack balance of plate in regular way.—*J. M. Hale, Mount Vernon, Ind.*

MEMORANDA.

NEBRASKA BOARD OF DENTAL SECRETARIES.

The Nebraska Board of Dental Secretaries will hold a regular meeting at Omaha, Nebraska, November 21, 22, 23, 24, for the examination of candidates.—S. A. Allen, Secretary, Loup City, Nebraska.

THE CONNECTICUT DENTAL COMMISSION.

The Dental Commissioners of Connecticut will meet at Hartford, November 16, 17, 18, 1916, to examine applicants for license to practice dentistry, and to transact any other business proper to come before them. For blanks and further information, address Edward Eberle, Recorder, 902 Main Street, Hartford, Connecticut.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing November 20th and continuing six days. For application blanks and full particulars address Dr. Fred J. Prow, Secretary, Bloomington, Indiana.—Fred J. Prow, Secretary, Bloomington, Indiana.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The South Dakota Board of Dental Examiners will hold its next meeting in Sioux Falls, S. D., January 9, 1917, beginning at nine o'clock a. m.

and continuing three days. All applications must be in the hands of the Secretary January 2. For further information address Robert Jasmann, Secretary, Scotland, South Dakota.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

The next annual meeting of the American Institute of Dental Teachers will be held at Hotel Adelphi, Philadelphia, Pa., January 23, 24, 25, 1917. A number of papers, reports and discussions relating especially to dental education will mark this meeting. All dental teachers are cordially invited to be present.—Abram Hoffman, Secretary, 529 Franklin Street, Buffalo, N. Y.

OHIO STATE DENTAL SOCIETY.

The fifty-first annual meeting of the Ohio State Dental Society will be held in Memorial Hall, Dayton, December 5, 6 and 7, 1916. The program and clinic committees promise us one of the best meetings in our history and we cordially invite all members of other State Societies to meet with us. The Secretary will gladly send a program on request.—T. I. Way, President, Cincinnati; F. R. Chapman, Secretary, Columbus.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants who may desire to practice dentistry in Michigan will be held in the Dental College at Ann Arbor, beginning Monday, November 13, 1916, at 8 o'clock A. M., and will continue through Saturday, November 18. All applications and credentials, together with fees, *must be in the hands* of the Secretary at least ten days prior to the date of examination. For application blanks and all further information, application should be made to R. O. Gillespie, Secretary-Treasurer, Stephenson, Mich.

DENTAL SURGEONS IN THE ARMY.

I am forwarding herewith the latest circular for the information of persons desiring to enter the Dental Corps of the Navy, and the following abstract taken therefrom:

"U. S. Naval Dental Corps—By Act of Congress, approved August 29, 1916, a large increase was provided for in this Corps, there being at the present time about fifty vacancies.

"Citizens of the United States, between 24 and 30 years of age, graduates of a standard medical or dental college, of good moral character and habits are eligible.

"Candidates are required to be physically sound, and to pass an examination in the usual professional branches; and an oral examination in preliminary education (diplomas or certificates may be submitted to the Board in this connection.)

"The next examination will take place in Washington, D. C., November 13, 1916. Subsequent dates will be announced later. Expenses are not allowed candidates appearing for examination.

"Dental officers are entitled to all the military courtesies and considerations accorded to other officers of the Navy. Pay ranges from $2,000 to $4,000 per annum, with allowances for quarters, and heat and light, if same is not furnished.

"For further information, address the Surgeon-General, U. S. Navy, Navy Department, Washington, D. C."

Very truly yours, W. C. Braisted, Surgeon-General, U. S. Navy.

ST. LOUIS DENTAL SOCIETY.

The 60th anniversary meeting of the St. Louis Dental Society will be held at the Planters Hotel, St. Louis, November 16, 17, 18, 1916.

A program offering the latest information and a rational procedure in the management of the vital problems confronting the profession at this time will be presented by men of recognized authority on the subjects.

Dr. Weston A. Price, of the Research Institute of the National Dental Association, will lecture on "The Present Status of Our Knowledge of the Relation of Mouth Infections to Systemic Disease." This will include a review of the recent researches on focal infection compared to clinical data, the processes by which organisms attack tissues, and the principles of resistance to infection, illustrated with stereopticon and motion pictures.

Dr. C. N. Johnson, in a paper on "Some of the Present Tendencies in Operative Dentistry," will discuss the efficiency of prophylaxis in preventing disease, the influence of silicates on modern practice, and the proper attitude of the dentist, the physician, and the radiographer toward focal infection associated with teeth.

Dr. Elmer S. Best, who has standardized the "Technic of Pulp Canal Surgery," will give the differential indications for sterilization and filling, apicoectomy and curetage, and extraction. He will outline the complete technic of aseptic pulp canal operations, and give a clinical demonstration.

Dr. Edward T. Tinker will teach the "Technic of Bridge Abutments on Vital Teeth," showing the detail of construction and radiographic proof of the practicability of conserving pulps in bridge work.

Dr. W. E. Cummer, of Toronto, will offer a solution to the problem of supplying artificial substitutes in the semi-edentulous mouths of the marytrs to the indiscriminate extraction of pulpless teeth. Under the title of "Partial Dentures," the glorified descendant of the inefficient, unhygienic fixed bridge and "ordinary" partial denture will be described.

One afternoon will be devoted to general clinics, another to manufacturers' exhibits and clinics, and the third to group clinics by the members of the St. Louis Dental Society, with the following sections: Prophylaxis, pulp operations, inlays, gold and amalgam fillings, porcelain crowns, inlays and stains, shell jacket, and dowel crowns, bar and anchor dentures, impressions and occlusion, deciduous teeth, radiodontia and oral surgery. Individual and study club clinics are solicited by the Clinic Committee, Dr. E. P. Dameron, DeMenil Bldg., St. Louis, Chairman.

Registration and admission strictly by National Dental Association membership cards, and the opening session will begin at 10 a. m., November 16, without formal ceremonies.

The following hotels are conveniently located and reservations should be made in advance. Planters, $1.50 to $6.00; Jefferson, $1.50 to $4.00; American, $1.50 to $2.50; Maryland, $1.00 to $4.00.

OBITUARY.

DR. LOOMIS POMROY HASKELL.

Dr. Haskell was born April 25, 1826, in Bangor, Maine. His early education was secured in the public schools of Salem, Mass., where his parents moved when he was a child. As a boy he began work in a printing office and a few years ago was banqueted as the oldest living printer. In 1845 he began the practice of dentistry in Boston, making prosthetic dentistry a specialty. In 1856 he moved to Milwaukee, Wis., and one year later came to Chicago, where he has continued in practice ever since. Dr. Haskell for a number of years was the Professor of Prosthetic Dentistry in the Chicago

College of Dental Surgery, and afterwards held similar position in Northwestern Dental College.

He founded and conducted the Haskell Postgraduate School of Prosthetic Dentistry for ten years.

In 1898 and 1899 Dr. Haskell conducted postgraduate classes in Berlin and Hamburg, Germany; Vienna, Austria, and Paris, France.

In 1863 and 1864 Dr. Haskell published the "People's Dental Journal—Quarterly" and for over forty years has been a liberal contributor to nearly all of the dental journals. His intimate association with the pioneers of the dental world furnished a fund of interesting anecdotes, which he delighted to relate to beginners, with the purpose of making them appreciate the great advantages of the present age, educationally and otherwise, which they have the opportunity to enjoy.

Dr. Haskell was one of the founders of the Illinois State Dental Society in 1864, and was the recipient of many honors. On the occasion of his 90th birthday he was the honored guest at a banquet, and with the exception of the loss of the sight of one eye, due to cataract, he looked the picture of health. His death was due to pneumonia, which developed after undergoing two surgical operations. The funeral service was conducted in the Congregational Church, at Hinsdale, Ill., of which he was an active member, and was attended by twenty-four members of the Chicago Dental Society, who officiated as active and honorary pallbearers, and many friends.—G. N. West.

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CONDUCTIVE ANESTHESIA; WITH LANTERN SLIDE DEMONSTRATION.*

BY H. A. POTTS, M. D., F. A. C. S., CHICAGO, ILL.

I was invited by your committee to prepare a paper on the subject of conductive anesthesia and have taken the liberty of preparing a few lines on local anesthesia and the combination of local with conductive anesthesia, as in most instances owing to diverse innervation a combination of both methods is necessary for a painless operation.

Many of the failures or partial failures have been due, I think, to a lack of thorough comprehension of the subject both from an anatomical and operative standpoint. I have nothing new to offer but will try to repeat the various observations and conclusions of such men as Schleich, Reclus, Braun, Bier, Fischer, and others who by their efforts have well-nigh perfected the technique.

I fear too many have gotten the idea that the induction of a conductive anesthesia alone in the jaws will enable them to operate painlessly in all classes of cases. This is not true if the parts to be operated upon be supplied by nerve-trunks other than the one injected. In other cases it is not necessary to inject a nerve trunk when the desired result can be accomplished by infiltration, which is probably less harmful than the injection of a nerve-trunk especially if it be done repeatedly. It has not been proven that repeated injections of a nerve trunk may cause a neuritis or tumor or some pathological change of a more or less serious nature. The method and technique must be chosen by the needs of each particular case, consequently, a thorough understanding of the fundamental principles of local as well as conductive anesthesia is necessary.

The history of local anesthesia may be divided into two parts, viz., (1) that induced before the discovery of cocain, and (2) that induced since that discovery.

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*Read before the Illinois State Dental Society, 1916

The ancients administered narcotic draughts and applied drugs locally to alleviate pain consequent to surgical operations. Alcohol, vinegar, sacred alligator fat, as well as the Memphian stone were used topically. Then came the use of warm instruments, followed by the smearing of fat upon them.

Perè in the 16th century, used a tight bandage, this was followed by severe compression of nerve trunks, which was often followed by dire results. This practice was modified by Esmarch whose bandage is in use today to produce ischemia which enhances the anesthetic as well as the pressure which impairs the sensory conduction through nerve trunks.

It was found that amputations in high cold altitudes were less painful, from this came the application of freezing mixtures, salt and ice, ether and ethyl-chlorid sprays which are very efficacious.

The introduction of the hypodermic syringe by Alexander Wood of Edinburg in 1853 marked an epoch in medicine as well as anesthesia, and as opium and morphine produced profound systemic effects, they were used locally as anesthetics. The anesthesia produced was due to the systemic effects of the drug and the introduction into the tissues to be operated upon of an indifferent substance.

Coca erythroxylum is a plant native to Peru and Bolivia; the leaves of this plant were treated with quick-lime and chewed by the natives in their religious rites, enabling them to endure starvation and to perform feats of great endurance. Its cultivation was controlled by the Incas, and Pizarro in 1532 found them using it. Later the Spaniards forbade its use, then monopolized its culture.

Scheyer brought some dried leaves to Europe, and Niemann and Lossen, pupils of Wöhler in Göttingen extracted the alkaloid cocain. Köller reported his use of the alkaloid in a paper read before the Congress of Ophthalmologists at Heidelberg in 1884.

From this time on rapid developments in its use were forthcoming, and many men were instrumental in developing it. Corning in 1885 observed that a bloodless field enhanced its action and permitted the use of weaker solutions.

Reclus and Schleich developed the infiltration method, Corning and Goldscheider discovered conductive anesthesia but it was first put into practice by Halstedt who injected the infra-orbital nerve from within the mouth and extracted teeth painlessly. Corning in 1885 introduced the drug into the subdural space of the lumbar region of the cord.

As cocain could not be sterilized by boiling without, at times, rendering it ineffectual and because of its toxicity, substitutes for it which could be boiled were eagerly sought and chemistry came to our aid with a number of drugs, some fully and others almost as efficacious, viz., Tropacocain, eucain, holocain, stovain, and the orthoform group. After experimentation and use the consensus of opinion favors novocain.

Toxicology:—The local and systemic effects of most of these anesthetics is very much the same and the conclusions formed from the actions of cocain in toxic doses apply to novocain which on account of its stability at high temperatures, enabling us to sterilize it, and low toxicity has brought it into general use.

Suffice it to say that as systemic effects varying from slight exhilaration to convulsions and coma depend upon the action upon the vital nerve centers of concentrated solutions, it behooves us to retard its absorption into the general circulation. This is best done about the head and face by combining varying proportions of the extract of suprarenal gland or its synthetic equivalent. That this does greatly retard absorption was demonstrated by Klapp.

Another safeguard is the use of weaker solutions. I prefer to dispense with percentage solutions and rely upon dosage. One-third of a grain has been given as a dose and is about one-seventh as toxic as cocain. This estimation was made without the combination with suprarenal extract, consequently, much larger doses of novocain when combined with suprarenal extract may be used. I have at times used as much as five or six-thirds without any evident toxic effects; one to three-thirds are, however, average doses.

These anesthetics are cell poisons having a special selective action upon nerve tissue and should be used in as weak solutions as possible in the varying conditions which call for their employment.

The element of time requisite to a perfect infiltration, together with other things with which we are not very familiar, not infrequently cause psychic shock, which is very frequently taken to be a manifestation of systemic poisoning; this can be obviated by quickly placing the patient in a recumbent position, or if necessary have the patient in this position before beginning.

One must not forget also that unpleasant symptoms may be caused by too large dosage of suprarenal extract, viz., rapid pulse, palpitation of the heart, air hunger, dizziness, etc. These are, however, evanescent and not serious. I have heard of no fatalities following the injection of a cubic centimeter of a 1 to 1,000 solution in severe asthmatic attacks. My own use of it in these cases has been very satisfactory. It is quite probable, however, that the local effect of suprarenal extract especially in less vascular tissues is different and that necrosis may follow the injection of too strong solutions.

It is probable that most cases of sloughing can be traced to the use of septic needles, syringes, or solutions, as a careful and systematic study of such a case will show inevitable signs of infection. On the other hand, perfectly sterile sloughing has followed the injection of novocain and suprarenal extract, in which the tissues have been killed by either one or a combination of the drugs. These are, however, rare but must be reckoned with.

Indications for local anesthesia, conductive anesthesia, or a combination of both. There is hardly an operation known to surgery which may not be done under them. Many that can be done better. I am tempted to say that all operations in the field of oral surgery in the adult can be done better but that is hardly true. Having the patient awake is a great advantage even though he be under an opiate. The bloodless field due to suprarenal extract is of inestimable advantage. Aspiration of foreign substances is obviated and the patient can expectorate.

One can do more careful and painstaking work without the added danger of an anesthetic and the posture of the patient can be easily changed to suit conditions. In many instances hospital care and expense can be eliminated and recovery from a general anesthetic, often arduous, is avoided. The services of an anesthetist and one assistant can be dispensed with.

Operations upon the whole maxilla, nose, antrum and upper part of the face can be done under infiltration or in combination with conductive anesthesia. The second branch may be injected at the foramen rotundum or infra-orbital canal.

In the mandible the combination is usually preferable and necessary back of the cuspids because of an extra innervation; the conductive anesthesia being induced by injection into one or both mental foramina or at one or both inferior dental foramina and locally as necessary.

Dangers: Systemic piosoning can be avoided by the combination with suprarenal extract and the use of not too concentrated solutions, also by keeping the needle in motion to avoid injection into a vein.

Sloughing can be almost entirely eliminated by rigidly adhering to an aseptic technique which includes the proper preparation of the field and removal of all infectious material, for instance, the scaling and polishing of teeth before extraction, etc.

Secondary hemorrhage does occur more frequently after the use of adrenalin and the patient or an assistant should be instructed how to pack a wound or socket.

Needles may be broken and lost in the tissues and can best be recovered at the time, but with care in their use, avoiding rusty needles or using iridio-platinum it will seldom occur. Neuritis may be caused by the injection either from injury to the nerve or by the solution, but if an isotonic sterile solution is used it is not frequent. Soreness and pain subsequent to the operation, I think, are more frequently due to traumatism, too rapid injection, or spicules of dead bone than from the proper injection of an isotonic solution. A process sprung or fractured during extraction should always be squeezed and reduced. Furthermore, sharp spicules and unduly prominant pieces of process should always be clipped or burred away.

The chief danger of anesthesia or analgesia most certainly lies in the fact that it permits injuries which in time cause some of the most serious systemic diseases. In the first place cavity preparation under painless conditions may lead to hyperemia and death of a pulp. Fillings, both conductors and non-conductors are going to be placed too near pulps and they are going to die. In most cases that means abscess either acute or chronic.

Secondly, a great danger attends the use of an anesthetic in devitalizing a pulp which is so easy both for patient and operator, the anesthetic being contributory. As we have abscesses whatever be their pathogenesis at the apices of both *poorly filled* and *perfectly filled* roots and do not have them about vital teeth something must be done to conserve the lives of the pulps or at the first intimation of infection they should be extracted or amputated and not treated and filled over and over again. Thirdly, a crown or a bridge which requires an anesthetic to be set had better be left in the laboratory for it certainly will be the cause of a gingivitis or pericementitis.

Factors influencing infiltration anesthesia. The more dense the gum and soft tissues are, the more force and longer time for infiltration are required, the anesthesia in these cases will last longer.

Inflamed tissue is more painful to needle puncture and infiltration, and the anesthesia is not so satisfactory. In such cases either conductive anesthesia by blocking the nerve-trunk or infiltrating an area around but beyond the inflamed area, which is only the conductive method applied to the smaller nerve branches, should he induced. High blood-pressure militates against a prolonged and successful anesthesia. The tissues are not easily blanched by the adrenalin and the red color returns very quickly; the anesthesia cannot remain long enough to effect a satisfactory combination with the nerve elements. In the injection of bone, age plays an important rôle and the success of the infiltration is dependent upon the foramina beneath the periosteum through which the anesthetic must pass. These foramina are more numerous in young subjects.

One cannot point out the various complications which influence the degree of anesthesia, as each case presents one or more difficulties which must be overcome as they arise.

Suffice it to say that for a successful conductive anesthesia one must place the solution within the nerve sheath or around it, the latter being far more common, and if the difficulties which arise in each case are not surmounted more or less of a failure will result.

For infiltration anesthesia the tissues must be saturated with the anesthetic solution, a small long needle, preferably a short bevel one being used, the injection being made slowly without bullaê production, and the needle being advanced as the injection proceeds, also gently injecting as the needle is withdrawn. This is to be followed by gentle pressure over the area of infiltration especially over the needle puncture.

THE AMERICAN AMBULANCE RED CROSS HOSPITAL

BY OWEN E. CASSILL, D. D. S., CHICAGO, ILL.

(Part Two.)

This part tells about my trip from Chicago to Paris through the military zone via New York and Bordeau.

Deciding and planning a trip abroad in war time does not differ much from that of peace time, except that people in general are inclined to discourage it on account of the danger element. As in everything else advice and suggestions must of course be considered, but in this case one must decide for oneself largely against the opinion of others. There are many to whom new places are only new pictures; but, after some wandering, this I have learned, and I wish I had learned it sooner, that travel is a matter not only of seeing, but of doing. It is much more than that. It is a matter of new human contacts. It is not of places alone but of people. What are regions but the setting of life? The setting of life here and abroad is different. To travel, then, is to do, not only to see. To take a chance and win. To feel the glow of a broader life. This is true at all times but especially at this time, because in addition this unusual environment is staged about once only in every century. One must be willing to learn how little he counts in the eternal scheme of things, to get close to the earth and see the stars. There is then in this a little philosophy of true adventure.

I have secured my passport from the U. S. Government at Washington, had it visaed by the French consul and booked with the Companie General Transatlantique S. S. Rochambeau. It was not easy to decide if it would be wiser to book on an American line boat to Liverpool, go to London and cross the English Channel to Paris, but since the mines and submarines had done more murdering in these waters, the French line seemed preferable. October 9th I went to Pier 57, New York, waiting room of the Companie General Transatlantique, where I had arranged to meet a dentist who was to accompany me. I heard some people say along the way: "How foolish to go on that boat," telling of the dangers and drawing mental pictures of the boat mined, submarined and all such. In a foreign accent: "I'll bet she's armed." The dentist was there. We had talked over the whole affair before this and ordered our baggage delivered to our cabin. To my astonishment as we were watching the preparations of the boat crew for sailing and the crowd of people bidding their friends good-bye, the dentist said excitedly: "I am not going." This did not change my plans. It is now 3 p. m. and we are scheduled to sail at 3:30. I go aboard at once and am shown by a most courteous steward to my home on the Great Wet Way for the next eight or twelve days. The steward asked: "Do you speak French?" I answered as best I could a little. He said: "I shall make you very comfortable." I recall how agreeably the manners of the French impressed me when I visited them before and I am glad to be with them and to live over again this good influence.

On board a foreign boat the customs of its country are used. We must now accustom ourselves to new usages and not believe that because we do such an such a thing a certain way that it is the same the world over, and that if one does not speak English he does not amount to much and is to be made fun of in attempts to speak. The first turning of a French door-knob is symbolic of this. Just as we turn the knob to the right, our neighbors turn it to the left. We may safely take it for granted that social usages, domestic arrangements and in fact nearly everything are criss-cross. A few months spent under a French roof it may be said is a process of dishabituation.

I returned to the deck to see the usual features of parting plus a few that are peculiar to French leave taking. There was a little added volubility and fusilades of those strictly sanitary double-timed osculations. The last package was swung aboard. The last female was pushed ashore. Handkerchiefs waving, a long whistle, and we are off! I am in a contemplative mood to take a chance. It is interesting to stay on deck until the vessel warps out and she turns her bow seaward in midstream. Soon we pass in good view of the New York skyscrapers, Ellis and

Coney Islands and slowly that other tie that binds us to France, Bartholdi's Statue of Liberty fades from view. In the meantime the sailors have been getting out the sea ladder for the pilot's descent. There is a sharp clank and the machinery stops and the pilot with his little bag of mail shakes hands with the captain and disappears over the rail to his boat below and when he is safe distance there is a clank-clank again, the machinery is running and we hope it will not stop until we pass through the war zone and land safely on the other side.

The purser is busy giving out passenger lists. This is a peculiarly important document and gives the names of our associates on the ocean trip. Biographical details are withheld, so ferreting out this and that one is the business of some passengers.. Gossip and scandal are inexhaustible. No names are asterisked and the steamship companies do not guarantee the quality of their passengers. There are about 200 cabin passengers and about half this number of steerage passengers. Most of the steerage passengers are Abyssinians who are returning from the Panama Exposition in San Francisco, where they have been on exhibition. Who's who on board is the question now; a great difficulty for the ferreters is that the labels on steamer chairs are hidden when people are sitting in them. Some are running around looking at labels on chairs not occupied and sometimes waiting until the occupant appears. If you happen to be sitting in the judge's or colonel's chair you will be taken for the judge or colonel until those gentlemen return. Life is begun afresh, leaving your hideous past, your unadmiring friends and your unappreciative relatives on shore. Who can be important with a set of abominable relatives, all with hatefully retentive memories, determined to keep a man down—where he belongs? Leave your bills behind. It is no use to be poor. Be rich the instant you cross the gang plank. Creditors cannot reach you. Moreover, there is all your land life in which to be poor. Not infrequently the delightful odor of scandal is scented. It is whispered that so and so—. What shall we do? A New England school ma'am spinster is for immediate action. I was for "watchful waiting." Widows are among the jolliest people aboard, and at sea they are particularly attractive. At sea also they are invariably "wealthy widows." You never hear of a transatlantic widow who is poor. She is always living on her "ample income" and is free from care.

It would seem that the passengers would be dull and sad on account of the dangers they might encounter later, but such is not the case, and it is really quite the opposite. One feels that one rather wishes something would happen and of course that we would get through it all right. Nearly all are happy and having a good time. A few are hunting for the guns which are supposed by them to be aboard. Some said they had heard there was one big gun on each end of the boat. All sorts of rumors soon spread and everyone must see for himself to be convinced. Jokes of all kinds were played. By looking over the side of the boat one might see what looked like a cannon projecting from a port hole. As this was noticed all were told to keep looking, to not give it away and soon there would be quite a crowd. There were a few calamity passengers who were more than excited. They would push their way through until they could see at close range. Some would get sore and say, "It is no joke. How can you fool about such a thing?" "It is going a little too far," a gentleman said, and the balance of the way over he was known by the name, "It's going a little too far." He was cured for good.

A gong sounds about the boat out on deck and all over. "What is that?" I heard someone say. That means that dinner is ready. Soon the big dining room is full and Americans try to get near French speaking people to learn a little French, and the French near the Americans to practice English. All are trying to learn. The greeting may be "good afternoon, this morning." I heard a man trying to read the menu. He wants ham and eggs. It seems Americans have a natural affinity for ham and eggs especially in a foreign country. In French ham sounds like jumbo. The steward is trying to tell him they have no ham and eggs, so he brings what he has. One can take chances on most any French bill of fare. We are given permanent places for the trip. Some try to pick out certain places for various reasons. Perhaps near an exit for advantage in case of sea sickness or submarines or what not, but little attention is paid to likes and dislikes, so again a chance is taken. Passengers are made up of French visitors returning to their homes, students, physicians and surgeons, nurses, French officers, motor drivers, dealers and manufacturers of artificial limbs, noses, eyes and all such with dealers in millinery, clothing and the like. It was interesting to hear the conversation of this mixed people, especially at meal time. It was said that one American lady remarked that she enjoyed to much to hear the French sing the "Mayonaise"(?) (Marseillaise).

Gradually we begin making acquaintances. Sometimes this is very funny. It may be about as follows: A man is leaning against the rail looking at the big waves and wondering. After gaping around him a bit a second man approaches the rail near the other and leans his elbows upon it. Presently he takes a package of chewing gum (I might mention here that this habit is not popular abroad and to the French looks ridiculous and helps to make a take off of Americans in vaudeville) from his pocket, selects a piece, puts it into his mouth and begins to chew. Then he spits idly into space, idly but HOMErically, a truly stupendous expectoration, a staggering discharge kept as much en masse as possible, for he wants to not only see but hear it hit the water. The first man, startled by the report both as it leaves the mouth and hits below glances up. Their eyes meet and there is vague glimmer of recognition. First man, "American?"

The second man—"Yes: Philadelphia."

"Been over before?" (It seems this question is always asked.) "How do you like the meals?"

"Not bad at all but I can't tell what to order. I tell you (knowingly) the Scandinavian lines are the best and then again I like the Italian lines. The German cooking was fine on the Kronprinz." The idea here is not so much to tell about the food. Figure this for yourself. If you were in this conversation and had not been across many times it would be better understood. There are yet some people who reveal themselves in this way. They are soon spotted and might as well be labeled. This is one phase of life and is a kind of observation work that gives one good training so that he himself can avoid acquiring this disease.

(To be continued.)

POSSIBLE ERRORS AS TO THE CAUSE OF DISCREPANCIES IN THE CAST GOLD INLAY.

BY L. C. BURGARD, D. D. S., LOUISVILLE, KY.

In trying to analyze the cause of the discrepancies that are more or less present between marginal adaptation of a cast inlay as compared with the wax pattern, dental literature affords us only conflicting theories, and casting techniques. In fact, a close study of articles from the pens of our foremost operators reveals theories in direct opposition.

Dr. Taggart, as far as we can learn, adheres to the same belief as he did when he gave to the profession his process. Briefly it consists of investing the wax pattern in his investment, mixed his way, bringing the investment to just high enough heat to volatilize the wax, remove from fire and cast when cold.

In opposition to this Drs. Price[1] and Van Horn[2] have rather conclusively proven wax elasticity. Taking this into consideration and the shrinkage of gold on crystalizing, they have devised special inlay making techniques to neutralize same. Only by resorting to such methods were they able to cast M. O. D. inlays that would seat in the cavity.

Dr. Goslee[3] has on repeated occasions given us another method that he uses for casting his copings for anterior crowns, which consists of first swedging a matrix and then adding the wax. In that way, so we infer from his statements, he controls the "warpage due to the change of molecules in crystalization of the casting." Dr. Ward[4] agrees with him by his statement: "The presence of this thin cap minimizes the warpage and shrinkage of the metal casting."

Dr. Ottolengui's[5] conclusions are that "success depends more upon the constancy and accuracy of technique than upon the utilization of any extraordinary means of overcoming faults that should not occur." If Dr. Taggart's technique is correct and if he gets the same results, then pray why cannot Drs. Price, Van Horn, Goslee and Ward get equally as good results without resorting to special means? Certainly operators of that type can be as "constant and accurate" as either Drs. Taggart or Ottolengui.

The fact that Dr. Taggart in his practical results finds that wax elasticity and the shrinkage or warping of gold does not interfere in getting accurate results, and since we have the statement of Dr. Capon that from personal experience and observation the work of Dr. Taggart would bear the closest inspection, let us analyze one phase of inlay making and possibly ascertain in what special detail others have erred.

WAX VOLATILIZING VS. INVESTMENT RESISTANCE.

Investment should be in such condition after wax is volatilized that at the time of casting the internal pressure exerted by the molten gold will resist mould distortion. Dr. Taggart has always advised that investment should never be heated to where all carbon residue is burnt out of mould walls. We should take into consideration the character of inlay investments, containing, as they do, plaster of Paris as a binder, which rapidly deteriorates under heat, thus lessening the investment resistance.

By clinical observation we know that if a casting is made before wax is completely volatilized such castings are smooth, rather of a polished surface, but rounded margins. If we, on the other hand, over-heat, such casting is coated with silica and has sharp margins. The former will drop easily into a cavity of M. O. D. type, the latter will not; the gold seems to have shrunken.

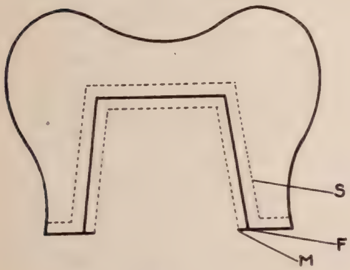

Fig.1.

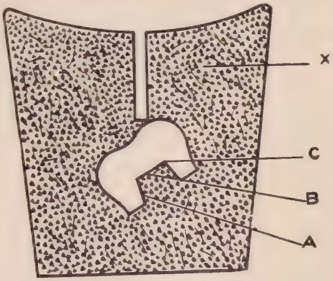

Fig.2.

From these two extremes we make the following deduction: If wax is incompletely volatilized the residue of wax carbon has left a coating as per dotted lines Fig. (1) and gold is prevented from reaching the true mould line "F" Fig. (1) or (A. B. C. Fig. 2). The result is that the distance between lines A and C, Fig. 2, or mesio-distal-axial line "S" Fig. (1), is greater than the original pattern. Clinically such M. O. D. inlays drop easily in a cavity, but there is no marginal fit.

If on the other hand we overheat, we go to the other extreme. Either due to a weakening of investment resistance by disintegration of plaster binder, or the complete obliteration of carbon beyond mould walls A, B, C (which possibly prevent the molten gold molecules from entering pores of the investment), or due to both, our casting is always distorted. The result is that the distance between lines A and C has lessened, as illustrated by line "M" Fig. (1), clinically such M. O. D. inlays will not seat and due to this our operator considers it as gold shrinkage, such an error in deduction being a most logical conclusion.

An inlay cast into a mould where wax has been correctly volatilized will seat to where it will bear close inspection. It is not so much that we strike a happy medium of the first two extremes mentioned, but merely a correct detail, one wherein all wax residue is obliterated and the heat applied has not caused an investment deterioration.

In a communication with Dr. Van Horn he considers our deduction as "chimerical." The point nevertheless remains that with investments made at room temperature by using different volatilizing methods we can produce a true casting or one that refuses to go to place. This being in harmony with the results of Dr. Taggart, our conclusion would most naturally be that their errors must be in the volatilizing technique.

As further evidence that it was not caused by metal distortion we submit the following experiment to either Drs. Price or Van Horn. If they will burnish gold 1:1000 or less to an M. O. D. cavity and on this build their wax pattern they will find that their M. O. D. casting without "neutralizing devices" will seat. It is that the gold matrix causes a mould line of a type that any volatilizing abuse of investment will prevent mould line distortion. It is not possible for the molten molecules to bite their way into the porous investment.

As to the deduction of Ward and Goslee it is contrary to all metallurgic principles that a tissue paper thickness of metal will control warpage of the same type of metal fused directly upon it and twenty or fifty times its bulk. Is not our preceding explanation a more logical one?

VOLATILIZING TECHNIQUE.

To place the investment over an open flame of a Bunsen burner and gradually raise the heat is at best guess work. To properly volatilize a large inlay takes more time than a small one, therefore each inlay being a law to itself, timing methods are not practical.

In our own practice we have found that an electric stove made by the Hot Point Electric Co., named "Elstovo," to be the most ideal. If a person does not care to make such an investment, by using an iron plate[6] over the Bunsen flame, like the top of a vulcanizing flask and placing cup on this gives good results. The electric stove has all in its favor, since the heat is always the same and is not affected by air currents.

To know when wax is properly volatilized we have found the following practical and dependable:

Our investment cup is placed on stove or iron plate with sprue hole down. On tilting the cup from time to time, carbon smoke is seen to escape. At such time as no smoke escapes on lifting cup our case is in a most ideal condition to cast, as it specially relates to the volatilizing detail. At no time during the heating process de we utilize a heat greater than when the green investment was placed upon it. Within twenty minutes after investing, the case is ready for the stove. To many it may come as a surprise to know that with heat so low a case is ready to cast in about the usual time employed where the heat is gradually increased.

All the foregoing theories along with the practical results are based upon one condition as it pertains to the investment. The investment we use is accurately weighed and mixing timed. At the finish of the mix it is in a rather fluid state; the pattern is coated, taking care that it is an even layer without trapping air, then tap sprue holder so that the fine particles settle close and compact around the pattern. If, however, we were to use the investment in this fluid consistency when we pour the balance, there would be insufficient body, causing a lack of resistance on volatilization, resulting usually in a rough, distorted casting, due to the same principle as explained in preceding chapter. In view of this, investment should be poured after it has hardened to the consistency that it pours like cold molasses. In other words, it has a tendency to pile or step.

SUMMARY.

First: No matter how careful our technique may be it avails us little unless all details are correct.

Second: Plaster of Paris being a binder in all investments, there is a very decided limit to its integrity when it comes to heat abuse.

Third: Abuse of investment in heating lessens its resistance. Such abuse and lessening of its resistance to the pressure exerted by the molten gold in casting causes a distortion of the true mesio-distal or occlusal mould lines.

Fourth: This axial line distortion in a practical case appears the same as shrinkage.

Fifth: Gold or platinum matrix 1:2000 could not possibly prevent shrinkage; it, however, prevents the molten gold molecules from going beyond the true axial mould lines.

Sixth: The burnishing of such matrix is the only guarantee against discrepancies in large gold castings.

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DENTAL EDUCATION OF THE PUBLIC.*

BY DAVID B. MCLAIN, JAMESTOWN, N. DAKOTA.

Mr. President and Gentlemen:

I know that before I am through with my paper, all of you except the few who have known me since the birth of this association will be howling "Ethics." So, to forefend myself, I will interpolate my understanding of ethics, as this paper on dental education of the public may infringe on your idea of ethics.

All ethics rests on a very simple foundation—be a gentleman as the cornerstone, and observe the Golden Rule as the rest of the foundation. To build your superstructure, remember that the supplicant or braggart is the one at a disadvantage, whether he begs or blows, for money or for business.

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*Read before the North Dakota Dental Society.

The tradesman may be an exception. He lauds his goods. The supplicant or braggart professional man lauds himself, his personal knowledge or skill, which to decent, high-minded people is always offensive.

Another difference is that the tradesman (merchant, mechanic and such) perforce puts his own interest first. The professional man, belonging to the so-called liberal professions, if worthy of the name and calling, must put the interest of his client (patient) first, even at his own loss. Elaborate that yourself—if I don't drop it now, I'll talk ethics all day.

Now then: Nearly all books and other matter foisted upon our profession for the enlightenment of the public fail. Why? They shoot over the heads of the public and they have not the proper ammunition. The average of our clientele reading them do not understand the stilted, technical language used. And, more to the point, how many women in your clientele will deliberately sit down and study or even give a cursory reading to any of those books? The Laity Number of *Oral Hygiene* was an exception, though many of the articles were open to the same objection.

To get folks to read anything, especially the matter we want them to read, there must be something to attract their attention. It cannot be forced on them. The most successful advertising tradesman in Denver is Jeffray, a haberdasher, and he does it by attacking some matter or person of great public interest—Judge Ben Lindsey, for instance, or the Ford Peace Trip. Giving the Purity Squad of Denver a whirl, he said, the chairman (giving his name) was so confounded pure that he buttoned his pants to his vest for fear his shirt would show, and wound up by advertising "Wayne's Silk Hose" for ladies, saying they were a sure cure for blindness, especially on a windy day. Jeffray's articles are in the same corner of the paper each morning, and folks look for them before the war news.

The old adage, "unsought advice is seldom taken," holds good in this and in every case. To educate the public in any direction, you must get the public to desire that education. How? By judicious advertising. By "judicious" I mean ethical and the two words can be made compatible. Mrs. Partington said "comparisons are odorous," but I am going to use one: If your druggist has an extra fine toilet preparation, can he get up a demand for it by advertising? He won't even have it on his shelves unless the makers have advertised it in the popular magazines and papers until the public wants it. We cannot advertise ourselves personally, as it puts us in the attitude of supplicants and braggarts, lauding ourselves and detracting from our confreres. Confreres? We wouldn't have any. Can we call advertising or dental-parlor men our confreres?

So, for us, ordinary advertising is barred.

How about a scheme of advertising which will attract the attention of the public, especially the female public, to dental subjects in general, not to the dentist individually? I say female especially, because in the whole scheme of parentage, animal and human, it is the female who cares for the welfare of the young. The great cry now is, "Dental Education and Care of the Children in School." We cannot foist ourselves on to the schools, not even to ask the privilege of giving a gratuitous lecture. Some fool or a lot of them would howl "Advertising." How many sixteen-year-old girls can tell which is the first permanent tooth erupted, or where, and when, and they must have had it in their studies, and if they don't know it at sixteen, they won't know it when they are mothers.

In my opinion, the initial drive in this campaign should be aimed at the mothers by attacking Women's Clubs of all kinds—Literary Clubs, Mothers' Clubs, Parents' and Teachers' Clubs, Women's Church Societies, any club or organization where women get together, and make the attack so pointed and persistent that the majority of them cannot ignore their duty in the matter, and I am morally certain that before long, through the mothers, the influence will reach the teachers and Boards of Education and we will have applications for advice and help and incidentally our practice will not suffer.

And here is the skeleton outline of my plan which each of you can work out to suit your locality and at the same time extend your lines so your attack will reach the general public, as well as the schools: At a meeting of your local society, or if you don't have one get your brethren together and suggest that you combine to meet the expense of having published in the reading notices of your local paper a series of short, snappy articles embodying the ideas you want taught. I began the campaign by inserting the following in the Jamestown *Daily Alert*: Notice that I make the first lines do duty as the caption of the article, and make it something that will catch the eye. And remember I am not now telling you these facts, but suggesting how to tell them to the public, woefully ignorant.

"THE PARENTS' AND TEACHERS' CLUB

is conducting a campaign to improve general conditions as to the health and welfare of school children. This to call the attention of the club and all mothers to a few facts.

"How many women know the temporary or baby teeth from the permanent in children of school age, or know where and when the first permanent tooth appears? Very few.

"Only ten per cent of school children in the United States have teeth in even fair condition. Only ten per cent are really efficient in their work. Ninety per cent have bad mouths, ninety per cent are deficient, and it is the same ten per cent and ninety per cent in each case, just in proportion as their teeth are bad their work is bad. This has been proven by careful tests. Ask your dentist.

"This condition of inefficiency comes not only from the pain and irritation from decayed and ragged teeth, but from auto-intoxication (self-poisoning), caused by decayed and putrid food from the cavities, going into the stomach with every bite they eat. The effects from these two causes are shown by the child being irritable and inattentive, and in many cases unmanageable and even vicious. The cause is easily removed. See your dentist. Have the mouth put in as good order as possible and see to it yourself that it is kept clean and watch the results. The mouth of the average child is like a cesspool if not watched. If your child is doing poor work in school consult your dentist."

This to be followed up by short pertinent articles at suitable intervals, as for instance:

"THE GOODRICH TIRE COMPANY

have a safety and hygiene department. Their 12,000 employes are compelled to have their mouths examined and put in good order and kept so. If they refuse, they go. There are two chairs with expert examiners and the patient can go to his own dentist if he chooses. They allow for financial condition of patient and help him if needed to prevent hardship. It pays the company by men doing better work. How about your own mouth or your child's mouth? How about your own work or your child's school work? Ask your dentist about this."

"Germany's efficiency is largely owing to the fact that she was the first country to compel the examination and correction of school children's teeth and in Germany that means all children seven years and up. Can you work, think or do business with your teeth troubling you or your stomach bad? The condition of the stomach depends mainly on condition of the teeth and how they are used. How about your child's school work? Only ten per cent of the school children in the United States have fairly good teeth, only ten per cent stand high in their school work, and it is the same ten per cent in each case. Just in proportion as their teeth are bad, their work is bad. Ask your dentist."

"A TERRIBLE EPIDEMIC IN GRAND FORKS,

a few years ago from impure water supply, carried off hundreds. How about impure food supply right in your own mouth? No matter how good the food or how well prepared, even a few decayed teeth infects it by mixing with fermented and often putrid contents of those cavities which cannot be kept clean. Look out for it, especially in your children's mouths. Ask your dentist. Nine-tenths of stomach and bowel troubles come from bad mouths. The Doctors Mayo and a host of other medicos say it and that the greatest means for preserving health and fighting disease lies in the hands of the dentist. Ask your dentist."

"CANCER

caused more than eighty thousand deaths in 1915. Nearly one-third of all cancers are in the mouth. More than one-third are in the stomach and bowels. The real cause is still unknown, but the exciting cause is known to be irritation. The main cause of irritation in the mouth is decayed or irregular teeth. The main cause of irritation in the stomach is from food spoiled or infected in the mouth by diseased teeth. Ask your dentist."

"A BAD PRAIRIE FIRE

can be avoided when it is the size of a hat—a man's hat. This is true of any fire or any disease, especially of the teeth. Catch it at the start when small. You cannot always know. Let your doctor look once in a while or twice in a while is better, for disease of your body and your dentist for disease of your teeth. If you wait until you find it yourself, it may be difficult, often impossible, to remedy and will surely cost more. Ask your dentist."

"A HIGH CLASS CAR

or watch would have a fine chance with a traveling tinker or a Cheap John in some distant city. Would you take your car or watch to a man of whom you know nothing except that he does cheap work? How about your teeth? The traveling dentist or dental parlor man may have a license from a state examining board which says nothing about his honesty. He guarantees his work; who guarantees him? Cheap work is always and all ways cheap. It is difficult and expensive and often impossible to repair or correct poor dental work. Ask your dentist."

These are only samples. You can surely find some of the brethren who can write better, but above all things avoid technicalities and make your language so understandable to the least educated of your field that "He who runs, though a fool, may read." A few years ago the Swedish government offered a liberal prize for an article on the toilet and hygiene of the mouth and teeth, to be in language so simple that the most illiterate could understand, that stipulation being the test for the prize, the government to finance the printing and broadcast distribution of the article. Our government has not yet reached the high state of paternalism involved in that, but that time will surely come. School boards and town boards all over the country are waking up on this matter, and such action as I outline will help in that waking up. It is easier for the small local societies to do this, as they can get quicker action through their local papers than can the state societies.

I hope that the local and district societies take this up, and I feel so deeply on it that I am willing to spend and be spent to further it, from my love of my life's profession and the good of this North Dakota Dental Society which has honored me in making me its first life member which means more to me after fifty years' practice than any of you can realize. Gentlemen, I thank you again for that and for your attention to my article.

ETIOLOGY AND TREATMENT OF PYORRHOEA ALVEOLARIS.*

BY V. B. NEWELL, D. D. S., STAFFORD, KANSAS.

It is probably audacious for me to try to discuss this subject in such a manner that it will add anything to the usefulness or truthfulness of the multifarious writings which have already been handed out to the dental profession. Pyorrhea alveolaris has been a subject for investigation amongst our best men for many years, and especially during the last decade. There has been enough written discussing the name alone to fill a dozen pretty good sized libraries. Though a dozen or more of the greatest minds that have ever honored the dental profession have gone deeply into every phase of this subject, the results of their findings have not been adequate for the exacting requirements of the dental profession. Though an enormous amount of data was definitely established, there have persistently been so many missing links in the chain of facts that all efforts at standardizing the treatment of pyorrhea alveolaris have been futile.

Those who are devoting their entire time to the subject have pretty definitely divided themselves into classes. One class cling to the theory that pyorrhea is a local condition and responds to local treatment only. Another class claims that it is symptomologic of a systemic condition requiring constitutional treatment. The etiological factors are considered to be uric acid deposits, diabetes, tuberculosis, etc.

Some other investigators claim to have discovered the specific cause of pyorrhea alveolaris to be a minute animalculae and the name of the little miscreant is ameba buccalis. These men put up such a strong argument backed by a "positive" remedy that for a while the dental profession was taken completely off its feet, so much so, that some of us have not yet entirely recovered our equipoise. But now comes forward such men as Price, Buckley, Hartzel, and others with the bacterial theory, so strongly substantiated by clinical evidence that for the present the rational dentist must accept, at least, a large amount of their theories.

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*Read before the Central Kansas Dental Association, Oct. 20, 1916.

In future years when the history is written of the evolution of the periodontist—or what ever name by which the pyorrhea specialist shall be known—it long since will have been discovered that each of these pioneer schools of thinkers have in turn discovered some fundamental truths which, if not vital to the success, are at least helpful in the treatment of this worst mouth disease.

The discovery of the bacterial origin of pyorrhea, together with the very important discovery that septic lesions in the mouth may be foci, or primary causes of many acute or chronic systemic disorders, has added immensely to the interest in the study of this disease. At a single bound it has brought the medical and dental professions in closer relationship than all the arguments of the last half century. The physician has now come to realize that certain systemic diseases cannot be eradicated while these putrescent conditions exist in the mouth. The teeth and their supporting structures, which were once regarded as organs entirely apart from the rest of the body, are now considered the most important gateways through which disease may enter. The dentist is no longer held as a mechanic whose duty is to repair injured or lost dental tissue, but is now to an enormous extent held responsible for the health and life of his patient, and to have a wider knowledge of the septic condition of the mouth.

The present status of the consideration of pyorrhea, as pretty generally accepted, is that it is bacterial, that the specific organism may be any one of a group of organisms, quite likely streptococcus, though diplococcus and spirochete are nearly always, if not always, present and must be dealt with; that the ameba is not a very important factor. The strepto-pneumococcus or streptococcus viridens, as it is commonly termed, is not always present in pyorrheal pockets but, where extensive necrosis of the alveolar process exist, it is frequently present. It is nearly always present in dental granuloma. As you probably know, this is the organism most commonly found in endocarditis.

Time will not permit me to enter into any extensive discussion of the morphology, homology and habitat of the different bacteria usually found in the condition known as pyorrhea alveolaris. However, that my reasons for following out certain lines of treatment may be understood, I will state that the pathogenic bacteria or their spores above mentioned find lodgment in the tissues surrounding the teeth where they are incubated, forming the initial focus of infection. These organisms are in most part selective in their action. Through the capillaries they are carried to the blood stream of the larger vessels and on until they are carried to a location which is favorable for their propagation and growth. Here they find lodgment, a new colony is formed resulting in a secondary lesion and focus for further infection. This location may be in the muscles, ligaments of the joints, glands, nervous or circulatory system, according to the nature of the organism. From this you can readily understand why local treatment alone, or extraction alone is not sufficient to eradicate the infection entirely from the system. The fact is, before the average case comes under your or my observation, the health of the patient is in a much more precarious condition than we have heretofore been aware. I have found symptoms of an impaired heart in almost every case of advanced pyorrhea, while rheumatism is quite common. True enough much benefit may be obtained by local treatment or extraction. Why shouldn't there be benefit? Frequently there are cases where a half ounce of pus is swallowed every twenty-four hours. The auto-intoxication from this alone is enough to break down an otherwise strong constitution. In some cases the natural forces may be able to combat other septic areas that have been formed, but such treatment is likely to prove to be only a temporary staying of the tide. A lot might here be said of the loss of the masticatory organs by extraction, the deleterious effect upon digestion, and the already impaired health, but space will not permit.

I want to ask your forbearance while I try to outline a course of treatment which has been in use in my office about a year and a half, with results which have been exceedingly gratifying. One of the most important items of the handling of a case is the examination, and a complete record of the findings, a record of condition found at each sitting, also of all work done at each sitting, and time consumed.

Examination: The examination consists of Inspection, x-Ray, Bacteriological, Stethoscopic, and Blood pressure.

Inspection: Upon an appropriate chart make record of name, age, sex, habit and all general conditions which may have a bearing upon the case, and a description of conditions found in the mouth; note all loose teeth, marking for extraction all hopelessly loose teeth and roots; note all misfit crowns and bridges—and that includes most of them; note all carious abscessed teeth; and by all means note all absent or destroyed contact points and mal-occlusions.

x-Ray: Obtain Roentgenograms of all very loose teeth, pulpless teeth, and abscessed teeth. The Roentgenograms should include not only the entire root of the tooth involved but sufficient of the area beyond and around the apex to determine any pathologic condition that may exist.

Microscopic: (a) Obtain some of contents of a pocket with a No. 1 Dentinol pyorrhea scaler or other similar instrument, spread on a warm slide, dilute with about ¼ min. normal salt solution and examine immediately for endameba; (b) Obtain another specimen from deep portion of pocket and, staining with Gramm method, examine for bacteria.

Urinalysis: Obtain specimen of urine and examine for albumen and sugar.

Impress the patient with serious consequence likely to result

Heart: With stethoscope examine condition of heart.

from pyorrhea if allowed to continue; the futility of treating unless the treatment is followed out to its conclusion; and the necessity of the patient's co-operation.

This examination will take considerable time. So don't forget to make entry upon book for time consumed. If the dentist is not prepared to make all this examination himself, he should be sure to have a definite understanding with the patient that the account with the physician is a separate one and he should arrange that with the doctor himself. I have had a little unpleasant experience in this matter.

Before outlining a treatment I want to here insert in my paper a few don'ts to be observed in the treatment of pyorrhea alveolaris. Don't use peroxid of hydrogen in the treatment of pyorrhea alveolaris. It has no place in the treatment of this disease, at least until all pockets and lesions are entirely healed. Don't use cold solutions or washes in a pyorrheal mouth, but on the contrary use them as warm as the patient can bear. Don't carry an instrument from one pocket to another until it has been at least partially sterilized. All treatments should be carried on on strictly aseptic lines—as nearly so as is possible in the human mouth.

Second Sitting: Before the second sitting you will have diagnosed your case; you will have consulted with the physician regarding the part he is to take in the correction of any constitutional troubles which your examination may have discovered, so you will be prepared to begin your work along intelligent lines.

At the beginning of each sitting I spray the mouth with hot normal salt solution, then copiously paint the gums and teeth with freshly prepared tincture of iodin. Having done this I next proceed to remove all hopelessly loose teeth, roots, misfit crowns and bridges, and seal up with temporary fillings all cavities that may exist. Should there be very much of this to do, which may consume considerable time or exhaust the patient, I conclude the sitting usually by prescribing a cathartic, and it is usually a drastic one, especially if the patient has a history of habitual constipation, or rheumatism—and most of them have. For an adult weighing, say, 150 pounds, I usually give the following, except where the patient is a pregnant woman,—then I would not give it:

℞

Pulv. hydrarg. mit.	gr. vi
Pulv. podoph.	gr. ii
Pulv. leptandrin	gr. iii
Sodii bicarb.	gr. xv

M. et ft. Chart. No. III.

Sig. One every three hrs.

——————— D.D.S.

Follow this with epsom salts.

At this time I also prescribe allcresta ipecac. There are some objections to prescribing this preparation per orem, but in most instances I get the desired effect without the use of the hypodermic which is necessary in the use of emetin hydrochlorid.

Third Sitting: We should now be ready to begin the surgical part of the treatment. For this work I find three sets of instruments are absolutely essential—a set for scaling and polishing the crowns, a set for scaling the roots and a set of files for polishing the roots after they have been scaled. In addition to these a small discoid curet for curetting necrotic areas and surfaces of bone, a Smith's or Roach instrument for holding orangewood polishers, and a set of Young's polishers. Also a sterilizing tray for holding 5 per cent. lysol solution in which every instrument is kept submerged while not in use.

The aim of a surgeon is to complete an operation at one time. He would not expect to obtain good results by partly amputating a limb or excising a tumor today and finishing the operation tomorrow. Then why should we expect good results by cutting and curetting in an infected pocket every day or every few days for weeks, and yet that is just the method by which dentists frequently try to cure pyorrhea, and then with utmost disgust condemn all men who pretend to affect a cure of pyorrhea.

It is usually best to begin on the lower left central, and bear in mind that each tooth and surrounding tissues must be finished before beginning another. I mean completely scale and polish the crown and root, and curette all necrotic bone from around it, so that tooth will not have to be disturbed again with a sharp instrument.

For removing the salivary calculus from these teeth I have found the L. & W. Nos. 1, 33, and 34 most effective. These are usually quite sufficient for the scaling of the crown, but in case all the proximal surfaces cannot be reached, I find the Harlan No. 9 scaler will be all that is necessary. I then polish the crown with a Young polisher and some pumice. Next step is to polish the root. I isolate the tooth with cotton rolls securely packed labially and lingually, so as to keep away the saliva. Place the saliva ejector back of the cotton and again paint the gum with iodin. Take a billet of neurocain and pass down into the pocket and with a small smooth instrument work it all around the root and gradually work down to the bottom of the pocket. Take a No. 1 Dentinol scaler or similar instrument and carefuly pass down to the bottom of the pocket on the labiomesial angle, place the ball of the thumb on the incisal end of the tooth to brace it from the force, and with firm upward stroke plane off the deposits. After a few strokes in this way a smooth surface may be obtained the entire length of the root. Then move the instrument to a position slightly around toward the mesioproximal and repeat the operation and so on as far as access can be had from the labial aspect. Then change back to the place of beginning and with a No. 2 Dentinol scaler, following the same method, plane off the labial and disto-proximal surface. In similar manner plane off the lingual surface. When this is all done remove the cotton and with salt solution in a Pelton syringe wash out the debris. Now, re-pack with cotton, as before, and with Nos. 13 and 14 Dentinol files, file and polish those roots until as perfect polish as possible has been obtained. Where access can be had to denuded roots complete the polishing with orangewood sticks and pumice. The instruments for this root work must be very sharp so as to pare off the roughened surface without using much force.

When the root has been thoroughly polished, next the necrotic bone should be curetted out. I have been unable to find an ideal instrument for this purpose. However, a No. 15 discoid, described on page 260 of the general catalogue, is very well adapted to this work. After this is carefully done wash out the debris with a warm salt solution, carefully press the gums up to the tooth and leave enough hemorrhage to form a blood clot. Do not flood with antiseptics, as the clot is nature's own dressing and a better one than man can devise. If the work is well done, two or three teeth will be all that the average operator should attempt at one sitting. Now, administer ½ c.c. pyorrhea vaccine containing 140,000,000 bacteria. I have been using the formula submitted by Dr. G. B. Harris, which contains the bacteria most commonly found in pyorrhea. The vaccines are given every four days. After the first dose, I give 280,000,000 bacteria, which I have found sufficient. I have never given more than eight administrations to an individual and usually find six enough.

The local treatments should be continued about every other day until all the teeth have been thoroughly polished, after which a couple of sittings per week should be devoted to keeping the crowns thoroughly cleaned and polished. Do not use a brush, but rather rubber cup, orange-wood points, tape, etc.

For home use I prescribe for a dentrifice Pepsodent, to be used after each meal, and a one per cent. solution of zinc chlorid for a wash to be used before retiring at night. Instruct the patient in the care of the teeth and insist upon them doing it.

Abscessed teeth must be cared for and their canals properly filled as quickly as possible. Where a multi-rooted tooth has a root completely exposed the pulp should be devitalized and that root amputated.

After the case has made considerable progress in healing there are usually some irregular, ragged places that will not become uniform. These should be trimmed down to conform to the rest. Deep pockets, especially in the lower jaw, should be obliterated by cutting out a V-shape piece extending nearly to the bottom of the pocket. In many cases nature is unable to obliterate these deep pockets by absorption and they would continue to hold food and residue sufficient to almost certainly cause the recurrence of the disease.

After every tooth and root has been thoroughly treated, as we have outlined, the subsequent treatments consist in augmenting the patient's efforts in keeping the teeth thoroughly clean and sanitary, together with restoring occlusion and contacts in whatever manner the condition may indicate. One parting word I will add, is keep away from band crowns and stationary bridges if it is possible. Instead use partial metal plates, removable bridges and solid crowns, with at least cast bases.

As for diet, a light diet of cereals, vegetables, fruits and very little meat is best. Dry toast and grape nuts are very good.

For home treatment I prescribe a one per cent. solution of zinc chlorid, which is put up in a very palatable form and sold under the proprietary name of Lavoris. This will be found to be a little strong and should be slightly diluted.

I sometimes find cases where the gums are very spongy and prone to bleed. These cases may be hastened by packing the interproximal spaces and pockets with cotton saturated with adrenalin chlorid for fifteen or twenty minutes at each sitting. If there is a pocket that persists flowing pus, be sure that your scaling has not been well done or there is some necrotic bone you have not removed, or else there is an abscess. If the gums continue inflamed and pus does not subside, it is quite likely some constitutional disorder exists which must be reached.

Do I cure every case? No, nor does any one else, but when I have adhered closely to the above technic I have obtained results which I have never before dreamed possible.

RADIOGRAPHIC FINDINGS IN CASES OF APICAL INFECTIONS.*

BY DR. FLOYD D. LEACH, CHICAGO, ILL.

Mr. President, Members of the North Shore Dental Society, Ladies and Gentlemen:

About six years ago there appeared in the *Lancet* an article written ostensibly as a very severe criticism upon the efforts of the American dentist in his attempt at an artificial replacement of the lost organs of mastication in the mouths of many of the patients who came under the observation of the author, Dr. Hunter.

This paper was really intended as a condemnation of our methods and workmanship; but in reality was simply the match touched to the fuse which had been laid many years previous by some of our own delvers in research along certain histologic and pathologic dental lines. It has served in a great measure to awaken the medical and dental professions to the importance of foci of infection and their relation to general systemic conditions; and it opened up a field whereby the use of the dental radiograph became the much needed aid in diagnostic procedures.

A little ancient history of dental radiography would not be out of place in a paper of this kind. Long before July of 1895 we had known of the induction coil for generating high tension currents, but it evolved upon certain European scientists, although they were working with high vacuum tubes before this time, to accidentally discover the peculiar action of the ray generating in such apparatus, of causing a florescence or lighting up of certain salts of calcium. Professor Conrad Roentgen, of University of Wurzburg, Germany, was the man who really first demonstrated the action of X-Ray upon the photographic plate. Immediately upon his announcement of the discovery of the so-called X-Ray, scientists all over the world began research and experimental work along this line; and the so-called American dentist, being rather of a progressive trend of mind, began making radiographs of the teeth in situ in the jaws. These men were Dr. C. Edmund Kells, Jr., of New Orleans, and Professor William J. Morton, of New York, who, in 1895 and 1896 demonstrated the use of the dental radiograph before several different dental societies during those years.

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*Read before the North Shore Branch of the Chicago Dental Society, Oct. 2, 1916.

Here in Chicago, as far back as 1900, and a little later, Dr. Fuchs, now deceased, Dr. H. L. Lewis, and Dr. Hollis Potter, under the stimulation and suggestions of some of our own strong men—you can easily guess the names—inaugurated the work in this city. The technique for making these shadow pictures was developed by the operator according to the needs and uses of these men. Today the work of Doctors Billings, Rosenow, Davis, and masters and teachers of our own profession, has placed the daily application of the dental radiograph in a zone of its own.

The uses of the radiograph in dentistry are as varied as the different branches of the science itself. Fundamentally, it comes under the department of diagnosis, and should follow the clinical examination, in fact, be incorporated in that procedure as a regular daily practice, and be filed with the history of the case, thus making a very complete and permanent record.

Many of our best consulting men are demanding that the mouth be examined radiographically before they will take it upon themselves to pass an opinion or make any statements regarding the diagnosis and prognosis of a certain case.

The office of this paper is to try to show the members of this dental society radiographically why it is that they cannot, with unclean fingers, instruments, and blistering, irritating drugs, enter with impunity that tiny, delicate, and by nature, beautifully and mechanically protected area, known to us as the apical space.

First, let us bring to your notice the location and technical meaning of this space.

We all know from our histology the manner in which a tooth is swung in its socket; that there is a layer of compact bone lining this receptacle, into which the alveolar ends of the fibres of the peridental membrane are built, the opposite ends of most of these fibres being firmly intrenched in the cementum of the tooth root; thus demonstrating so perfectly a very delicate shock absorber.

Now, follow this, we may call it the peridental membrane fibre space, toward the apex of the root, and we find that this crevice widens slightly, as it passes around the root end, and while many fibres intermingle and cross over to the opposite sides, they do not make up the bulk of the contents of the space. In fact, it is a very vascular and delicate structure we have, as the end of the root is passed.

Now, what is just the reason for this change in tissues? A real drugs and a technique trained to the finest point of touch would "safety-first" plan of mechanics. A slack wire space showing how well nature has been planned when it comes to the operation and protection of a very delicate part of our anatomy.

For illustration upon a larger scale, take, for instance, the telegraph, telephone, and current cable fields. The engineer has decided to make a terminal for distributing purposes upon a certain pole. He allows quite a large loop of cable, depending upon the size and exposure to stress, the object being to prevent any breakage of the wire connections by a sudden or heavy strain upon the pole or cable, thus copying exactly the design of this important apical space.

If this tiny area was of no great importance to the maintenance of the tooth, it would not have been so well protected, secluded and hidden as it is in the cancellous bone, and shielded by the buccal, labial, and lingual plates of compact bone of the alveolar structure of the jaws. This one fact alone ought to be enough to teach us to hold in greatest respect this all-important accessory to the organs of mastication.

Dr. Talbot, in a discussion of a paper on root-canal technique, before the Section of Stomatology of the American Medical Association, at the great meeting held in June of this year at Detroit, made a statement that was very decided regarding the dental pulp and its accessories. He said that he believed that the dental pulp and its accessories was one of the most important end organs in the human body.

This statement was very impressive, because when you come to think that there is only one small entrance and exit or passageway for the blood and nerve supply of the pulp between the bone of the alveolar process and the apical foramen, or foramina, and that, through the apical space, is it right, considering the dire results which may follow, for us to go on destroying these pulps intentionally, in order to make abuttments for fixed and removable bridgework, knowing as we do that we are taking the chance of opening up each time a new area to act as a focus of infection?

To be sure, there are many teeth, especially of the single rooted variety, which are fairly easy of access, where it would be possible to properly treat and fill the root canals, and not be placing the operation upon a gambling basis. However, cleanliness carried to the point of surgical asepsis with the application of the very mildest of probably eliminate to a great degree this every-day mutilation of the tissues of the apical space.

One feels very certain after the examination of thousands of dental radiographs and listening to hundreds of histories of cases, that after the dental pulp is removed, whether this procedure was made necessary by the neglect of the patient or the intentional destruction of this end organ by the dentist, that from that instant the greatest function of the tissues of the apical space and the space itself, is lost; and inasmuch as the major part of this work has been eliminated it goes on into a state of atrophy, thus naturally lowering its resistance, opening up an entrance for infection, either via the root canal or by way of the many foramina which lie in the neighboring bone. This may be the answer to the question which has often been put during the interpretation of certain radiographs: "Why is it that about the apices of almost every devitalized tooth there is always a more or less decided shadow, denoting either a slight or a large destruction of tissue, or else a decided change of structure of the end of the root?

We have found that in almost every case where the treatment of any root has been attempted, especially when no rubber dam was used, and very irritating drugs applied, that the shadowgraph shows a decided lowering in density of the end of the root itself. This same fact is true in almost every case where a dead pulp, whether putrescent or not, is found in a tooth and recorded on a radiograph.

This condition of lower density and non-resistance to the passage of the X-ray must mean a decalcification of the root end, either by the waste products of bacteria or if uninfected it may be the normal physiologic action of an irritated tissue exudate, or a stimulation of certain odontoclastic cells. At any rate, this root end of lower density is certainly a foreign body, and much more dangerous to the general welfare of the patient than would be a walled off or incysted lead bullet.

If time permitted, a number of very interesting cases with histories of general systemic conditions, some of them where we are quite sure that *one* of these apical spaces, with perhaps an unfilled root canal, as a focus of infection, could be presented; but inasmuch as the essayist feels that he has probably opened up rather a large subject for thought and discussion only a few of these cases will be shown on the screen.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-SECOND ANNUAL MEETING, HELD AT SPRINGFIELD, MAY 9-12, 1916.

DISCUSSION ON THE PAPER BY DR. H. A. POTTS ON "CONDUCTIVE ANESTHESIA."

DR. ARTHUR E. SMITH, CHICAGO, ILLS.

Mr. President and Members of the Society: It gives me great pleasure to take part in this discussion, from the fact that I am a firm believer in eliminating pain from dental operations. I wish to compliment Dr. Potts upon his paper and in the main I agree with him in the work presented. The question of properly applied anesthesia is of great importance to our profession, and we should recognize this. The careless administration of both general and local anesthetics should be discontinued, but it is usually done by practitioners having little knowledge of the toxic effect of the agents used.

I wish to go on record as stating that the time is not far distant for the dentist who inflicts pain to be looked upon by fellow practitioners in the same manner as those men doing improper bridge work and root canal work are looked upon today. I have been called an enthusiast on this subject, but that matters not to me, for I know what the elimination of pain has done for me, and I know how patients appreciate dental service free from pain.

I have had a number say to me that they thought "Nerve blocking" was complicated and technical. My answer to this is, that in order to master local anesthesia you must give it the same careful thought and consideration as other scientific subjects. To be sure, nerve blocking is not to be used by the operator who does not understand it. It requires study just the same as the technique for perfect root canal work. I made the statement several times yesterday in my clinics, when a thorough knowledge of the anatomical parts is mastered, at least 7/10 of the technique is accomplished. Surely no progressive dentist will pass it by from the fact it requires some study. My advice to those who attempt to make nerve blocking injections without first familiarizing themselves with the various phases—that the best place for the hypodermic syringe is in the cabinet. But to those who master the subject they will find nerve blocking of inestimable value. The field of anesthesia is surely a large and scientific one and the dentist of today who does not take advantage of these methods which science affords him is surely turning patients to the comforting office. It is a pleasure to see the great advancement in the science of anesthesia and it is gratifying to see such a large number of our profession taking advantage of the opportunities which science now offers in methods of relieving pain.

The days of painful dentistry have passed for those who have availed themselves of the knowledge which is necessary for good service. The old adage "to do good dentistry you must hurt" is now changed to "in rendering the best service we must not hurt." Dr. Potts has ably related the methods of eliminating pain which were practiced years ago, and it is needless to comment upon this phase, but allow me to say that it was Horace Wells who, in the year 1844, marked the real advancement in anesthesia.

Until recent times progress was rather slow, but during the last few years its advancement has been most remarkable in all of its phases. Until recently it was the custom of the general surgeon to allow unskilled anesthesists to take a patient's life in hand, thus disregarding the grave danger which accompanies so many anesthesias. The modern surgeon has learned that it requires skill and training to properly meet all contingencies and will in most cases employ the services of anesthetists skilled in the art.

The surgeon has also found that mortality is decreased when anesthetics are given by one skilled in this particular branch of science. This holds true for dental anesthetists as well as for general surgery anesthetists. Too little attention has been paid to thoroughness and training in the past. The dental profession should feel proud of the fact that it is responsible for the discovery of several agents for producing anesthesia, as well as perfecting the technic in numerous ways. I believe that many dentists are too prone to let anesthesia be a matter of routine or unthinking application, and for lay sources of statistics to show anesthesia so hazardous does injustice to the best available work.

The discussion centered around the inaccuracy of the lay information and the demand for professional records accessible for study

—a matter those who have worked on anesthetic mortality must appreciate. Anesthesia is receiving more consideration today than ever before and has developed into a distinct science, and slowly but surely will rise to a plane to which it rightly belongs. The work of Crile on anoci-association is really a revelation and it proves, without question, that a patient under general anesthesia is not free from the afferent impulses which are generated at the sight of an operation. It has been proven that afferent impulses travel to the brain and cause certain pathological changes in the brain cells even when the patient is under general anesthesia. This resulted many times in the prolongation of post operative recovery of a patient. Afferent impulses now are blocked by using well selected methods and especially through the medium of nerve blocking. The man at the speaking end of the telephone is ringing his bell but the central station does not answer from the fact that the wires between the two stations are severed and this has been accomplished by nerve blocking.

Many operations which the dental practitioner is called upon to perform cause excruciating pain and I believe that we are always justified in relieving our patients of pain, which they will appreciate, and will enable us to render better service; and, last but not least, it elevates our profession. Anoci-association is applicable to dental practice, but it is true many factors enter into its employment. Nerve blocking properly executed and combined with the other factors, which I will not take time to discuss, is certainly invaluable to every practicing dentist. Nerve blocking and other methods for producing local anesthesia demand certain well defined technic and the same careful consideration as other scientific subjects. One cannot hope to become a master of this art with only a limited experience. Local anesthesia eliminates traumatic shock but does not eliminate psychic shock. Therefore it behooves the operator to be sure with his *modus operandi*. If the operator is tactful, and masterful of the situations, the psychic influence will be a minor factor. With certain operations in oral surgery the combining of nitrous oxid—oxygen, and nerve blocking is of advantage. Hence anoci-association.

The best index to the patient's condition before, during, and after the operation is the condition of the blood pressure. When operating under nerve blocking, with or without general anesthesia, the blood pressure will be found to be more or less uniform. Therefore, any trauma caused by the operation does not cause any detrimental effects upon blood pressure, providing the area of the operative field has been completely blocked. Post operative complications and discomforts are diminished and the period of disability is shortened.

In research work on animals I have injected 50 c.c. of the anesthetic solution subcutaneously, with practically no effect on blood pressure or respiration, as recorded by the kymograph. Dr. Potts spoke of the possibility of the death of pulps when anesthesia is used. I realize there possibly will be dead pulps resulting from the indiscriminate use of nerve blocking, or by the use of any other method for eliminating pain. It is true that when the patient is free from pain, the most careful operator may expose a pulp occasionally but that should not prevent us from rendering service free from pain. If we know the anatomy of the tooth, taking into consideration the age of the patient; the amount of the recession of the pulp, and the amount of the secondary dentin, I think any possible trouble will be minimized. Gentlemen, the time is rapidly passing for the dental operator to inflict pain, and I do not see how it is possible to practice dentistry along scientific lines without inflicting a certain amount of pain upon the patient unless he takes advantage of the modern methods science now offers.

The patient that returns to the dentist within a few months or a year after having a filling placed—with the filling in her pocketbook, surely proves that there must be something wrong with the cavity preparation. In many cases cavities are not prepared along scientific lines and probably all the decayed dentin is not removed because of the pain; and many operators insert the fillings in these cavities, very much to their regret later. One cannot convince me, in order to prepare a cavity scientifically, as by the Black system, it is necessary to hurt the patient.

Dr. Potts mentioned the dosage, and the advisability of platinum needles and I wish to add a few words on these subjects. I have injected 15 c.c. of a 2% solution of novocain in a large number of cases, blocking the entire upper and lower jaws, and in very few cases have experienced any untoward effects upon the respiration or blood pressure. Within the bounds of reason, say the amount of solution necessary to block the entire upper and lower jaws, which comes within the field of the dentist, there should be little or no hesitancy in injecting this amount, providing, of course, the patient does not present some serious pathological condition. Now, with reference to needles. By all means use special iridio-platinum needles designed for this work, because they do not break easily and can be sterilized in the flame. This cannot be done with a steel needle. Needles should never be inserted in the tissue up to the hub. It is better to have several millimeters exposed after the point is resting in the proper location, then if the needle breaks, which no doubt would be at the hub, there would be little difficulty in removing it.

Gratifying results are obtained from nerve blocking when the technic is properly executed. However, it is not possible to secure 100% success with it, nor can we secure 100% success with the use of nitrous oxid—oxygen, ether, chloroform, or somnoform. The experienced anesthetists never expect to obtain 100% success with any anesthetic, and it is evident that we can attain a higher ideal through the careful selection of the anesthetic agent or agents best fitted to each individual case.

Local anesthesia in its various forms, coupled with the recognized sedatives, is of untold value in dental practice. Nerve blocking is adapted to those parts where the nerve trunks are readily reached by the needle. A keynote to success in nerve blocking is to deposit the solution near the nerve branch supplying the area about the operation—then an accurate knowledge of the anatomy of the nerves and their anastomoses is necessary for rational procedure. I have prepared a number of wet anatomical specimens which were sectioned at various levels, thus exposing the various nerve trunks and other anatomical structures, and have found them exceedingly instructive.

When one masters the technic for nerve blocking, the various nerve trunks and their anastomoses supplying the various structures of the jaws can be easily blocked. In nerve blocking and infiltration anesthesia, the patient is wholly conscious; can prevent the inspiration of blood and can assist with the operation. Resections of the alveolar process of jaw, and treatment of trifacial neuralgia in removing a part of inferior dental nerve can be accomplished. The impacted third molar, which is many times difficult of removal under a general anesthetic, is removed under nerve blocking anesthesia with the co-operation of our patient, and we have anesthesia lasting one hour, thus giving ample time to remove the tooth, though imbedded deep into the tissue, with a minimum amount of laceration. Nerve blocking in cases of fractures of the jaws is of great value. I have been called upon to block the nerve supply for several patients with fractures and the results were gratifying. Complete apposition of the bones is secured and splints are adjusted with complete co-operation of the patient and with the absence of pain.

The subject of anesthesia is a very broad one and I wish I could go into the subject further, but the time will not permit. But before closing I wish to state again that the technic for nerve blocking must be mastered, giving strict attention to dosage, isotonia, and sterility of the injecting solution, and last but not least, strict asepsis must be observed at all times.

Dr. E. F. Hazell (Springfield):

Doctor Potts' paper was mis-sent to Peoria, therefore I will try to make a few remarks on some things I have caught as he went along. It seems to me that we are extremely fortunate to have this subject presented to us by men like Doctor Potts and Doctor Smith, Doctor Potts having had the rare good fortune to be under the teaching of men while he was in Europe, who have been working this thing out, and it is certainly a great addition to our literature.

The method of infiltration and conduction has proven so valuable to many of us that I know we will not feel like giving it up, but will push forward, and master it to a greater degree. In my hands I have had no systemic effects thus far. I have had psychic shock in a case recently, but in a very short time it disappeared and we went on with the operation to a successful completion.

Stress has been laid upon the sterile condition of both field and instruments, which is exceedingly important. This area, as we all know, is difficult to render sterile, and if you are not careful you will have bad results. You are going into deep tissue and it is not a very hard matter to foresee the painful tonsilar abscess that may follow if you make a mandible injection with a needle that has not been sterilized and a field that is not clean.

Dr. Potts touched upon the use of a drug and the technique with reference to setting a crown. I fully agree with him that if the work is so painful as to render this necessary, it had better be left out of the mouth.

Dr. Henry L. Whipple (Quincy):

It is very true that it is hard to describe in detail the exact method of doing these things in a paper. These gentlemen are here for observation, and they get the most good out of clinics, and I do not really believe there is much in the paper to discuss as far as technique is concerned.

A great many complain that systemic trouble occurs, but I cannot see why this should happen if the field is sterile and the instruments are sterile and the operation done exactly as the technique calls for. And we can see very easily that the greatest field for this method of anesthesia is in oral surgery rather than in operative dentistry. Impactions are very numerous, we find, and they are much more easily done by this method than to give a general anesthetic unless they go to a hospital for operation and post-operative treatment. The conductive anesthetic in these impactions makes it possible for you to work with a patient that is absolutely meek and obeys every instruction you give him, and the mouth is in every way easier to work on.

In the other surgical operation that Doctor Smith speaks of—fractures, we can readily see why this is a very valuable method. As far as immediate removal of pulps is concerned, I have not tried that, and I have been so opposed to the immediate removal of pulps that I am not convinced I will try even this method to do that.

Dr. W. H. G. Logan (Chicago):

The use of conductive anesthesia or infiltrating with novocain suprarenin is one of the finest things that these men who are called upon to do minor operations have found, and it will be of great value I believe to many dentists. However, I would not advise all of you to take up the use of novocain, for some will not be successful. You may get some deep-seated infiltrations which will be followed by deep-seated infections, and serious ones. The first proposition, if you are going to take up this thing at all, is the question of the solution. I took my work in Berlin under Doctor Hertel four or five years ago and when I saw them take out great sections of the jaw I was very enthusiastic. I came home, and the first case I had was that of a child fourteen to sixteen years old needing rather an extensive operation. When I made my injection the patient became hysterical. I had chosen a nervous young person, which was an error. You should not try this on children, only in the exceptional type of child. It is appropriate for adults who are not extremely nervous. It is not difficult for one who is accustomed to its use to get along with a nervous patient, when you know what you can do with it. My point is that if you are going to use this, first be careful about the water. For a period of two or three years I purchased distilled water, so-called, at the drug-store, and then boiled that, and yet I got a good many sore areas following injections. I always injected slowly. Later I used fresh distilled water. You can distil this water yourself. There is a still known as the Silverman still, that costs about $8, and in fifteen minutes you can distil enough to last you for a number of cases. Distil the water the day you use it, and then boil that water at the time you prepare the solution. Use the solutions from one-half to two per cent, and practically all of your work can be done with six to eight c.c. I once had a very serious result but not fatal with four c.c. of a two per cent solution.

As to what to do in case of collapse, I was told in Germany that they had a law requiring you to have camphorated validol in the office, as that was considered the official antidote. In this country it has been ascertained by experiments that ether is a better remedy to employ in case of collapse from over-dose of this anesthetic than anything else. In the department of experimental medicine in the University of Minnesota they gave animals an extreme dose producing convulsions, and revived them with ether. The conclusion was reached that the ether was the best antidote to use under these circumstances.

As to the injection, you should be careful never to make a false move; never let an instrument hit another to make a noise; just walk quietly and carefully about the room, never knocking a chair or a door; take up the instruments carefully, speak to the patient quietly and with every confidence, take hold of the patient as if you knew positively that the result will be satisfactory, and then carefully make the injection. As has been pointed out by Doctor Smith, never carry the injection into the tissue until it makes a fold around the hub. You place the needle under the periosteum, if the patient moves the needle may break. If your hub is somewhat distant from the tissue and it breaks the end is where you can draw it out. Make that a rule you never deviate from. Yes, always have the needle exposed some distance beyond the hub. Then carry the fluid in slowly, and move the needle a little bit when you are injecting. Then massage the infiltrated tissues. If you are injecting in the nasal palatine region leave 5 to 7 m., in the posterior 5 to 10 m., about 2 c.c. in the infraorbital, 2 c.c. for mandible injection, and 8 to 10 m. for the buccinator nerve. If you follow that technic you can do this work and not cause pain, be careful not to carry too much fluid into the tissues in a short time. If you make mandibular injection, which takes twenty minutes before anesthesia is complete, you would not immediately inject the buccinator nerve. Why? It will take only ten minutes for the buccinator and twenty for the other, so do the mandibular first, then in eight or ten minutes make buccinator injection with the result you have an hour for your operation.

This anesthetic is a fine thing for the man who has to remove third molars or extract broken off roots. It is not difficult to get positive results with novocain suprarenin solutions if you know your anatomy, use sterile solutions, and confine its use to those cases where local anesthesia is indicated.

Dr. Arthur D. Black (Chicago):

I will not enter into a discussion of this paper, because I doubt if I could add anything important to the splendid technique which has been presented. I think it might be of interest, however, to cite one case which happened in my practice during the past year and which may explain, possibly, some of the claimed fatalities which have occurred, not only from the use of cocain, but nitrous oxid and other methods of anesthesia. I remember a report of a case by a physician in Evanston a few years ago, in which he had injected less than five minims of a very weak solution of cocain into the tissue surrounding a tonsil, and the patient was dead in two minutes. We have all heard of cases in which, with the administration of nitrous oxid, the patient did not recover. I have always felt that quite a few of these cases of death were not necessarily due to the anesthetic, although they are charged to it. The case in point was this:

A woman of fifty-six, who had had two years previously a rather extensive operation for carcinoma of the breast, and was apparently making a good fight against a recurrence, came to me at regular intervals for the care of her mouth. Radiographs of the mouth had shown a slight abscess at the apex of the lower right first bicuspid, with the root canal filling about half the length of the root. I had removed the filling and after treatment had made a better one, although not a perfect one, because there was excementosis of the root and the canal was very small toward the apex. I was watching the bone about the root end with the radiograph for a little while to determine whether or not I would extract it. This patient developed something wrong with the eyesight and was rapidly going blind over a period of a very few weeks, so that her physician and oculist in consultation with myself inquired especially about this tooth which I had previously reported. I had told them what I was doing with the tooth and that if they wished me to give that patient a clear bill, I should extract that tooth, and they asked that it be extracted.

It so happened that two or three years before this time I had removed an upper third molar for this patient under nitrous oxid, with very satisfactory results, but between the time that I decided to extract this bicuspid and the time of the appointment, in thinking about the case I made up my mind that I would inject novocain, and would not give gas. I do not know why I did that, because there was not anything very definite to contra-indicate the use of nitrous oxid. When she came in she said, "I suppose you will give me gas." I said, "No, I am going to use something else," so I injected a solution containing one-third grain of novocain with adrenalin. Because there was some excementosis of the root of this tooth, I drilled to the buccal and lingual sides to cut away the process first. I used the infiltration method, watching carefully all the time. I injected slowly and secured sufficiently good anesthesia. About the time I was through cutting the bone away the patient uttered a sharp cry, put her hand to her head and said she suffered a tremendously severe pain, and was very much frightened. I reassured her that it could not be from the injection that I had made. She asked that her physician be phoned for, but he could not be located, and to reassure her I asked Doctor Gilmer to step in, and he told her exactly the same as I had. By that time she was comfortable, and I finished the operation without any further discomfort. She remained in my office five or ten miuntes, talked over the phone, left at two o'clock, went home, ate her lunch, and at four o'clock died suddenly of cerebral hemorrhage. We felt sure then that she had had a slight cerebral hemorrhage in my office. Had I administered nitrous oxid, she would probably have died in my chair. All of which goes to show that I was very fortunate.

Dr. H. A. Potts, Chicago, closing:

It seems to me that you men are all better satisfied with the paper than I was. I rather expected there would be a general discussion and you would try to get me tangled up in points of technique. I of course could not go into the subject fully, and am very grateful to those who have discussed the paper for the kind way in which they have handled it. I thought I left loopholes enough for you to get in and ask me questions. However, it resolves itself into this, as has been said,—acquire a thorough understanding of what you intend to do; map out a plan of campaign, and make your attack according to that plan. This means that you must understand the lay of the land, the instruments with which you work, the peculiar characteristics of the drug, and the kind of patient upon which to use that drug. To become proficient or even to develop ourselves at all satisfactorily we must understand something of the foundation principles upon which the procedure is built. I have nothing new to offer, I simply tried to say something to help you in the study of the text-books. There has been plenty written upon the subject, and if I, together with the gentlemen who have discussed the paper have been able to help you pick out of the records the practical things which apply to such technique, I shall have been rewarded for the effort. I thank you.

REPORT OF THE CLINIC COMMITTEE.

C. F. B. Stowell, Chairman, Chicago;
A. B. Patterson, Joliet;
F. A. Neuhoff, Belleville.

Frederick H. Swartz. Synthetic filling. Placed a simple mesial filling in an upper left lateral.

H. V. Merck. No clinic. Excuse: Unavoidable circumstances.

Paul M. Bryer. No clinic. Excuse: Sickness in family.

S. C. Wood. No clinic. Excuse: Unforeseen circumstances.

J. S. Gordon. No clinic. Excuse: Was present, but called home on account of illness of son.

Claude B. Brownell. Replacing a facing on a crown or bridge in the mouth, using a Steele facing. Method: Cut off the pins flush with the backing. Drill a slot lengthwise, slightly countersinking on the lingual. Select your facing, and grind, if necessary. Cut a strip of 34 G. 24 K. gold, as wide as the slot is long, bend over a common pin, pinch together, making a post. Coat the outside with anti-flux, spread the flat part of post slightly, and flow solder in the post to make it solid.

Place in position from the lingual, and with facing in position, burnish the flat part to fit the margins. Trim off the surplus; fill with casting wax, remove and cast.

Polish, and smear cement over the post and backing. Insert from the lingual and slide facing on, which locks it both ways and leaves a smooth surface on the lingual.

Charles B. Mead. Casting against wax. Method: Using Taggart's inlay wax and investment. Wax melts and flows freely at between 170 and 180 degrees. In twenty minutes after pouring investment, at a heat of not over 212 degrees, wax will disappear completely, leaving mould perfectly clean, with surfaces covered with a coating of wax, not to be measured, thinner than smallest amount of cement that can be placed between inlay and cavity wall. It is essential that this thin wax coating receives the hot metal. At a very low heat, not enough to change the color of the investment (caused by burning the wax), drive off all moisture. Test with cold dry mirror and when vapor will leave mirror in two or three seconds, remove case and allow to cool before casting. Experience enables one to time the heating process within a minute or two. When melting gold, do not heat ring. When gold is hot enough to cast, the top of the investment coming in contact with wet, pulpy asbestos generates sufficient steam to make perfect casts, when using steam machines. Pressure, air, gas, steam or centrifugal must be used. Wax in the investment makes it impossible to use suction machines. The molten metal of any karat, including scrap gold, crowns and bridges, when cast against the wax-covered walls of the mould, carbonizes the wax, excludes the air and results in clean, bright, smooth inlays, sharp margins and absolutely no oxidation. Water and brush only necessary to clean them. The thin coating of wax covering the mould makes the inlay enough smaller to overcome the expansion of the investment, resulting in inlays that do not bind, but go to place, especially at the gingival, which heretofore has been the imperfect margin.

O. G. Collins. Showed radiographs of some unusual cases of impacted teeth.

A. E. Converse. No clinic. Called out of town the morning of the last day of the meeting.

Hilles T. Brown. Gave a timely and appropriate clinic in the anatomy of the head, neck and thorax. The demonstrations were given over the dissected cadavers. All the superficial and deep structures of the head and neck were dissected and demonstrated. Median sagittal sections contributed to the plain understanding of the deep anatomy of the dental field, and also included at the same time the anatomy of the areas involved in nerve-blocking and conductive anesthesia.

E. M. Robbins. No clinic. Personal illness. Excused.

G. L. Kennedy. No clinic. Excuse: Illness in family.

R. C. Amrine. Showed a new soldering iron which is used the same as a copper soldering iron, except there is no flux of any kind used. The clinician demonstrated the method by soldering different metal pins to porcelain crowns, soldering aluminum, and soldering glass together.

A. A. Powell. No clinic. Excused.

W. H. Pontious. Interchangeable facings. The clinician exhibited a porcelain facing with an oblong countersunk mortise, and a backing with a stud to fit the said mortise. Mortise and stud of sufficient depth and form that will support and hold the facing solidly. The idea is to provide a facing with its means of attachment absolutely standard in all moulds in relation to incisal edge, central location, size and form of mortise and stud, and away from all its circumference. Second, an all porcelain bicuspid and molar with a V-shaped countersunk mortise, with its base at the back of the tooth and its apex directed diagonally into the heaviest part of the tooth, terminating just under the outer cusp.

J. P. Luthringer. Anterior inlay bridges. Cast gold inlays for anterior bridge anchorages in which the cavity preparation in vital teeth was such that anchorage was secured by a short post at the gingival angle of the cavity, and a tapering spur or lug, which was whipped over the incisal edge on a direct line with the post. The pin was from two to three millimeters long, of 18 gauge round wire, while the spur measured about 3 millimeters long and 1 millimeter at the broadest part, and tapered to a rounded point. Other than the spur no gold was visible.

G. G. Garrison. Removing pulps with cocain. Use large crystals cocain hydrochlorid. Moisten with adrenalin to a saturated solution. Cut several pieces from an absorbent canal point into the solution to use as a vehicle for carrying a small amount just where you want it, and nowhere else. If the pulp is exposed or nearly so, place a small amount directly over the exposure and apply gentle pressure with unvulcanized rubber from one to three minutes. Repetition of the above procedure is often necessary. The clinician claims that 30 per cent. of all pulps can be anesthetized in this manner in from one to three minutes without any pain whatever; 30 per cent. will take from three to ten minutes, and 30 per cent. will take from ten minutes to one hour. Clinician says 10 per cent. of the pulps are not affected by cocain.

T. E. Hoover. No clinic.

P. A. Pyper. An easy way of taking wax impressions for gold inlays. Cavity prepared upon general plans for gold inlay work. Taggart's wax (or any good wax) warmed over a flame till one end is quite soft enough to take form of cavity easily and the other end rather rigid, then force into cavity by hand pressure, not allowing the patient to bite down on it. When cool, remove without doing any carving. Mix a small portion of Taggart's investment compound (or any good investment). Invert or place same into wax impression just where the tooth was. When the investment is set hard, carve the wax down to the investment tooth, leaving the wax in the cavity, then carve to details. Insert sprue in the usual place. Then put all into water for a few minutes to hydrate, and invest just the same as if no first investment were there, and cast the usual way.

Advantages: First, wax so used can be forced into every detail of the cavity.

Second, leaving the entire bulk of wax gives handle to remove impression without distorting wax.

Third, easier to carve wax out of the mouth, and a better chance for detail carving without distortion.

Grafton Monroe. No clinic. Personal illness.

Virgil P. Perisho. Medication in pyorrhea. Showed method of applying drug into deep pockets by use of a smooth broach. Also the use of a glass barrel (Lure) syringe, with a curved needle.

J. F. F. Waltz. An interesting and unusual application of a silicate. Clinician exhibited a patient whose permanent teeth erupted without enamel. A very disfiguring stain gathered. Treatment consisted of built up labial and buccal surfaces of upper and lower eight anterior teeth. Silicious cements were used, so that a nearly perfect appearance results after a year's service in the mouth.

F. O. Sale. Anatomical occlusion illustrating the Gysi Articulator. Over good models wax trial plates were made. The correct bite and occlusal plane were determined. The proper mounting on the articulator and the arranging of the teeth anatomically was demonstrated. True bite teeth were used.

Joseph Eisenstaedt. Demonstration in a projecting lantern slide clinic of the constructive and destructive changes occurring in the supporting tissues of the teeth, as found in chronic osteitis of the superior maxilla from decalcified sections. The slides showed the following: Absorption of cementum, rebuilding of cementum, excementosis, suppurative pericementitis (apical), absorption of cementum with dentine and the rebuilding of bone (ankylosis and new growth of bone in root canal), osteomyelitis showing bacteria and areas of marked absorption, secondary dentin showing two deposits, reattachment of fibers of peridental membrane, absorption of peridental bone, periosteal bone, and Haversian system bone.

Waid Doty. Swaged seamless crown. Simplicity of method and economy of construction were the salient points of this clinic. The apparatus required consists of a casting ring, an ingot of low-fusing metal, a medium weight swaging hammer, and a gold shell to suit the case. Manipulation: The root is prepared the same as for a two-piece crown. Fit a band of aluminum or copper to the root. Take an impression and run up the model. Carve cusps in plaster-of-Paris and cut out of model the tooth to be crowned. Mount on the end of a stick for ease in handling. It is well to trim the excess plaster from around the band at the gingival. This will mark the die in such a way that trimming the crown after swaging will be easier.

Fuse the metal and pour into the ring. Before the metal cools plunge the model you have mounted on the stick into the metal, holding firm until the metal cools. The rest of the method is well known. The clinician warns against the use of a heavy hammer.

Edward G. Snodgrass. Restoring of lower incisors by a bridge, presumably using one's own teeth. Cuspids used for attachment. A typical case is where the teeth are about to be lost through pyorrhea. Extract and use the same teeth for bridge.

Technique: Cut off enough of the root to allow free space between the gums and the end of the root. Make caps for ends of the roots of pure gold plate, gauge 36. Let caps extend up on the lingual side as far as possible. Assemble on model with teeth in caps. Remove teeth, invest, and solder, using 20 K. gold solder. Solder first from lingual, then reinvest and flow solder over the labial. Polish, and cement teeth in place. Lastly, cement to attachments in the mouth.

Keep the teeth in water during the process of construction of the bridge. Thoroughly cleanse and fill all the canals to prevent discoloration.

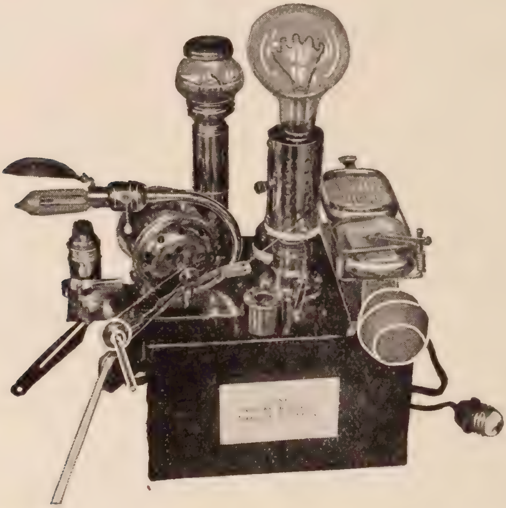
George D. Sitherwood. Silicious cement fillings without rubber dam, and method of using pigments to secure the correct color.

The use of silicious cement fillings in those cavities which so often occur at the cervical margin of the anterior teeth is particularly indicated where it is fully as difficult to apply the rubber dam as it is to make the fillings.

The cavities are prepared the same as you would operate for a gold inlay. Cotton rolls are held in place either with the fingers or an Ivory cotton roll holder, and with a saliva ejector in place the cavity is thoroughly dried with spunk and warm air. Then, while your assistant holds a piece of spunk or cotton roll over the cavity you mix your cement, using a square-sided bottle filled with water at a temperature of about 65° F. In this clinic Ames' Berylite was used, and the requisite color secured by adding a very minute quantity of pigment to a body of white, light yellow, bluish white, or whatever leading color of powder had been selected. Only four colors of powder were used—white, light yellow, dark yellow and bluish white. Four colors of pigment were used—yellow, brown, gray and blue. A medium setting fluid was used. When mixed and placed in cavity, it required about five minutes to become hard enough to be trimmed. Two of Black's gold trimming knives were used to trim the margins, a straight-edged blade, and a convex-edged blade, always drawing the knife toward you from the margin of the filling. If you use a chisel or blade that you push, the margin will chip. In many cases the filling, especially if in the upper anterior teeth, may be polished with fine cuttlefish disk immediately. The filling is then covered with a thin coating of melted paraffin to better protect it from moisture. Agate instruments were used to mix and place the cement, as they are best. Any quick-setting silicious cement may be worked and colored with the pigments in the same manner.

Albert F. Schaefer. No clinic. Arrived too late.

W. F. Reber. No clinic. Personal illness.



L. L. Funk. Sanitary mechanical broach wrapping and aseptic root treatment. The mechanical broach wrapper wraps cotton on broaches more perfectly, quickly, efficiently and aseptically than it can be done by hand, thus stimulating more thorough and sufficient root treatment. Owing to simplicity of preparing the broach for use, there is less danger of insufficient or under treatment. The cotton being wrapped over the end of an apex treating broach which has a fork on the end of it insures carrying treatment cotton to the apical foramen, thus removing debris and medicating the canal at the most vital point.

By thorough use of this method, instruments and cotton pass through five processes of sterilization. Sterilized original packages, dry machine sterilized, 390° F.; steam, 212° F. Formaldehyde vapor. Lastly, broach is passed over a sponge saturated with phenolyptol. Cotton is drawn from the container with hook and deposited between interchangeable celluloid leaves. A fresh sterile leaf may be used for each case in hand.

Perfect asepsis is insured, since cotton never comes in contact with the fingers or other septic materials. Broaches, bulk cotton, cotton pellets, gutta percha points, temporary stopping and chip-blower are subjected to 290° F., and higher heat, if desired. These several precautionary measures against possibility of conveying pathogenic bacteria into the root canal constitute a reasonably certain aseptic root treatment.

E. T. Evans. Office helps. Clinician demonstrated the making of a "home-made" electric water-heater, a hot-air syringe, a mouth lamp, and case-heater. The case-heater: Wire four or five thirty-penny wire nails together and place over a Bunsen to lay the case on. Bunsen for use at the chair: Use an acetylene gas tip instead of regular. Use a double-hinged gas bracket and do away with rubber tubing. Alloy balance: Take balance that comes with Taggart investment. Make a notch for the fulcrum so that the distance from the center of each pan to it will be in proportion as wanted for mercury and alloy. Balance with soft solder and give a coat of paint or bronze to prevent the mercury from adhering. Waste cotton receiver: Use small collapsible tablet boxes (cost, about $1.30 per M.). Make a small clip of tin and fasten same under bracket table. Slip box to place and puncture end with cotton pliers. Have a new one for each patient. Solder a large gauge hypodermic needle on the oil can spout to use in oiling the handpiece.

Herbert A. Potts. Oral surgery clinic at St. John's Hospital. Under conductive and local anesthesia, removed a rapidly-growing tumor from the lower jaw. The tumor was of small cherry size, red and soft. A previous microscopical section of it proved it to be a giant-celled sarcoma. At the Prince Sanatarium, under local anesthesia, Dr. Potts removed a portion of a root from the region of the first molar, right maxilla. Novocain and adrenalin solution was the anesthetic used in each case.

G. P. Saville. No clinic. Excused.

H. P. Bachman. Robinson remedy. To make the Robinson remedy, take caustic potash (purified), carbolic acid crystals (pure) in equal parts, and grind together in a mortar for about two hours, until a thoroughly triturated paste is secured.

Use it in abscessed teeth, as follows: Clean out the pulp chamber and then work down into the canals with a smooth broach. Leave a surplus in the pulp chamber and seal with any kind of stopping desired.

In inflamed, erupting third molars, work it in between the gum and the tooth. It can also be worked down into any pus pockets, such as fistulae or pyorrhea pockets.

G. H. Henderson. Up-to-date ideas about amalgam. The clinician demonstrated: First, accuracy, weigh materials. Second, packing. This must be done with small instruments, using care to pack from the center to the outside, and continue this on successive layers of amalgam. Result, a hard, dense, smooth filling.

C. L. Cassell. Easy fitting cast cusps. In the matter of taking wax impression, as for cast cusps upon gold bands, we found upon casting the cusp and trying it back on the root that it seemed always the cusp was too thick, making the crown too long, which necessitated grinding the crown or the root to procure articulation. This condition was found to be caused by the removal of the band and impression at one time. This produced a suction, drawing the wax up slightly into the band.

To overcome this condition, we remove the wax impression separately. Then remove the band. Fit the two together, tack with a hot spatula, carve and cast. They fit without grinding.

George T. Banzet. Clinic consisted of the treatment of pyorrhea, abscess and general pyorrhea. Ethyl borate gas, Dunlop paste, and pocket packer were used. Object: Securing and maintaining hyperemia, with the consequent feeding and rejuvenation.

George W. Young. Indirect method of making inlays. Models were shown, also finished and unfinished inlays. A band is fitted around the tooth in the mouth, after cavity is prepared. Impression is taken in modeling compound. This is filled with copper alloy. Proceed with the die as you would in the mouth.

C. P. Jackson. Demonstration of Gilmer's method of wiring the teeth in cases of fracture of mandible.

S. C. Sims. Method of correcting the shrinking of investments, especially where the casting of an M. O. D. inlay is the case. Dividing, casting in two separate pieces, and soldering the pieces together are the essential points.

E. S. Hodgson. Clinic consisted of showing an upper bicuspid gold shell crown, with replaceable porcelain facing. The chief advantage of this crown is as an abutment sustaining a bridge upon upper first bicuspids. Quite often the roots and canals are small in this particular tooth. Posts are dangerous in such teeth. The shell crown gives plenty of surface for the attachment of solder, sufficient space for anchorage, and an esthetic appearance.

H. H. Hayes. Clinician showed the new Roach attachment. It consists of a modified form of the ball and socket. In the new idea the sphere becomes flattened and permits of a close adaptation of the replacement to the anchorage and gives ample room for the first tooth on the denture, something which heretofore has not been possible.

F. H. Reinders. Indirect inlay for cervical fillings. The cavity extending below the free margin of the gum. Cavity prepared as usual and impression taken in modeling compound. Make a cement model and fill with mat gold. Split the model. Cement in cavity. This avoids the use of rubber dam.

L. R. Snowden. Restoring the lower left first molar with amalgam. The tooth had gone to such an extent that the most of dentists would have restored it with a gold crown. Clinician reproduced the lost portions with amalgam, viz., contour, contact points, cusps and grooves.

F. H. Bowman. Demonstrated a method of perfecting the fitting of bands in Richmond crown construction, by the use of a measuring compass.

Horace C. Buttery. Presented a new style cast gold inlay, suitable as a strong bridge abutment for the incisor and cuspid teeth. It is most practical for bridge work where the lateral or central incisor is missing, providing the teeth on either side of the space are not decayed, as this method requires a strong and healthy tooth. Take a small inverted cone or knife-edged stone and with this cut a small step at the incisal lingual, the step being made the same as for step-cavity preparation. The only difference is that it is continued the full breadth of the tooth mesio-distally. A second step is made likewise at a point about four mm. from the gum line at the linguo-gingival. In between the two steps the enamel is ground away enough to give thickness and strength to the inlay when completed, but not enough to irritate the pulp. A groove is prepared on the side next to the space of the extracted tooth. Three canals are sunk for retaining the posts, one at the center of the gingival step, two in the incisal step—one on each side of the pulp. These canals are cut to a depth of two or three millimeters with a 20 gauge fissure bur.

Iridio-platinum wire, 20 mm. gauge, is inserted in the three canals, cut plenty long enough. Wax impression is then taken, and cast with the posts.

Charles R. Baker, Evanston, Ill. An idea concerning the development of the jaws. To be a most efficient masticatory apparatus, the teeth must be in normal occlusion. The length of the bite of the upper anterior teeth is one of the most important features of occlusion. A most unfortunate condition exists in mouths where the mesio-distal relation of the bicuspids and molars is normal, the cusps interlocking correctly, and where there is an abnormally long over-bite of the upper incisors and cuspids. This condition is due to a lack of harmony in the sizes of the upper and lower dental arches during the development of the jaws. The clinician illustrated by means of casts of actual cases how this condition is produced, and also how the dentist may help the jaws to develop in harmony as to size and prevent such results.

To illustrate: We will presume that in the mouth of a child the permanent first molars and incisors have erupted and that the teeth are in normal occlusion (see Fig. 1). The next permanent teeth to erupt will be the first bicuspids. We must now remember that the deciduous molars occupy much more space mesio-distally in the arches than do the bicuspids which succeed them; sometimes there is a difference of 3 mm. between the mesio-distal width of a deciduous molar and its successor. Normally the deciduous lower first molars will be lost and the lower first bicuspids will erupt. A few weeks later the deciduous upper first molars will be lost and the upper first bicuspids will erupt. A year later the deciduous lower second molars will be lost and the lower second bicuspids will erupt. A few weeks later the deciduous upper second molars will be lost and the upper second bicuspids will erupt.

Now, let us suppose that the deciduous lower first molars

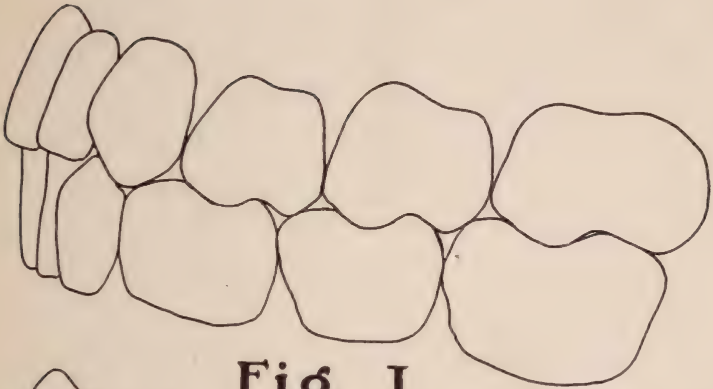


Fig. I.

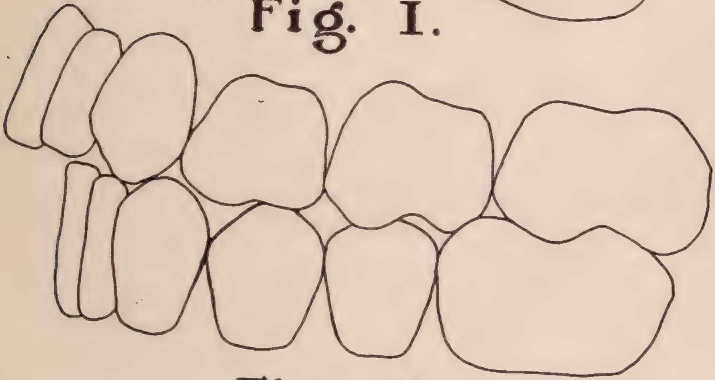


Fig. II.

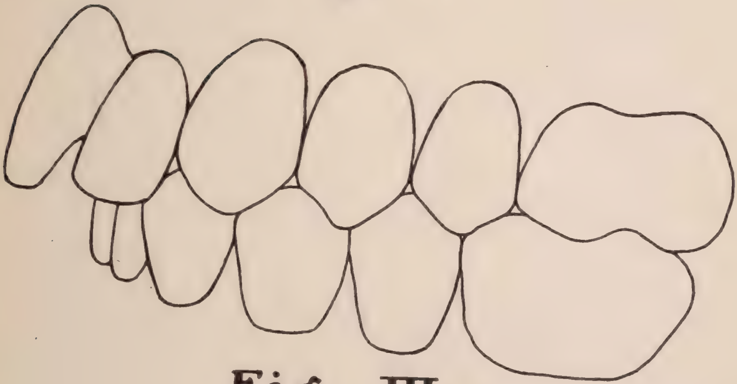


Fig. III.

were lost and the lower first bicuspids erupted, but the deciduous upper first molars remained in place for a considerable time; or, to illustrate the idea better, let us suppose that all deciduous lower molars were lost and all lower bicuspids erupted, while all deciduous upper molars remained in the arch for a considerable time. (See Fig. 2.) Too much space is being maintained in the upper arch by the deciduous upper molars, and the jaws do not harmonize in size. The permanent molars interlock normally, but the upper arch is too large for the lower arch and the upper anterior teeth are held far to the labial of the lower anterior teeth. The result is that both the upper and lower anterior teeth elongate, due to the lack of occlusion during a period of rapid growth of the jaws. Later, when the deciduous upper molars are lost and replaced by bicuspids, the bicuspids probably will interlock normally, but the patient will have the abnormal overbite, with a corresponding protrusion of the upper anterior teeth. (See Fig. 3.) The orthodontic treatment of this form of malocclusion seldom results satisfactorily.

The following rule is suggested, in order that dentists may help prevent the malocclusion described:

RULE: AS SOON AS A LOWER BICUSPID FULLY ERUPTS, THE CORRESPONDING DECIDUOUS UPPER MOLAR SHOULD BE REMOVED FROM THE ARCH.

There will be no crowding of the upper bicuspids, although they may not erupt for some considerable time, for the occlusion will prevent the upper first molar moving mesially, and the upper anterior teeth are to the labial of the lower teeth, and, therefore, cannot move distally.

The time for the extraction of a deciduous upper molar should not be determined by the physical condition of the individual tooth, but by considering the relation of that tooth to the development of the jaws. A deciduous upper molar, although perfect in structure, will help to produce malocclusion, if allowed to remain too long in the arch. It is important to keep the deciduous lower molars in the arch until the bicuspids are due to erupt, and just as important to remove the deciduous upper molars at the right time. It is frequently advisable to use skiagraphs to determine the presence of bicuspids before extracting deciduous molars.

D. M. Gallie, Jr., Chicago. A clinic demonstrating the use piece, which is used to change barbed broaches into smooth broaches. By the use of the same mandrel revolving in handpiece, cotton may be wound tightly about the smooth broach for drying or carrying medicament into root canals.

Methods of sterilizing the cotton-wound broaches before use were demonstrated and the preparation of broaches in regard to length and fineness to fit various conditions and positions of canals was also illustrated.

A. E. Colletti, Chicago. Showed cavity preparations by means of large models.

Elmore W. Elliot, Chicago. The preparation of root-canals for filling. This clinic was for the purpose of demonstrating the technic of opening the canals of pulpless teeth. The clinician advocated the use of "acids" rather than "alkalies" for the purpose; and showed the advantages possessed by phenolsulphonic acid. With the tooth isolated by the rubber dam, and all necessary instruments sterilized, the cavity is opened freely with a pulp chamber bur, permitting direct access to all canals. The pulp chamber is then flooded with the acid and with a fine twist broach one can quite readily twist a way to the root-end. Larger twist broaches are now used until the canal is sufficiently enlarged to permit the introduction of a file or barb broach, with which the sides of the canal is filed. It is understood that the work is always done with both acid and broach. After the canal is thus filed with the broach in contact with the acid, a mushy substance will appear. This is readily removed and the canal made clean by neutralizing the excess acid with a solution of sodium bicarbonate (10%).

With the canal clean and sterile, one may fill with whatever material they see fit. The clinician advocated eucapercha and gutta percha points.

J. H. Kaplan. No clinic. No excuse.

T. L. Grisamore. Preventive orthodontia. Gave clinic, but did not report.

F. F. Molt. No clinic. No excuse.

The following gave no clinic nor excuse: J. O. Rice, B. G. Wood, G. E. Conroy, Owen E. Cassill, E. A. Schmuck, A. D. Kyner, Chas. G. Irons, Thos. H. Leathers, H. H. Hubbard, C. J. Sowle.

Geo. A. Thompson is credited with giving clinic: Non-Irritating of a special mandrel, made to fit the S. S. White engine hand-Crowns and Attachments. Gave no report of same.

PROGRESSIVE CLINICS.

William E. Harper. A practical demonstration of an amalgam technique which secures non-leaking fillings. Nine fillings were made and tested immediately upon completion of the fillings, to show the uniform results it is possible to attain by the new technique. It was not considered practical to carry the test beyond ten pounds air pressure, at which none of the fillings leaked. Such fillings were tested later, after the fillings had set. They showed no leak at twenty pounds.

C. W. Coltrin. Removable partial dentures. In this clinic the lingual and palatal bar constructions were chiefly considered, the main points being the advantages of safe plate outlines in regard to protection of the soft tissues and conservation of the remaining natural teeth; strength of construction and possibilities of employment in difficult cases, such as supplying the missing posterior teeth on one side of the arch only. Consideration was also given to the different forms of commercial attachments, their uses and abuses. Models demonstrating the construction and operation of the Roach, Gilmore, Morgan and Bishoff-Otrich attachments were exhibited.

A special form of attachment was shown, designed to be used in anchoring the free end of the bar in cases where a saddle and bar are used in supplying the missing posterior teeth on one side of arch only. This attachment consists of a tube, split pin and clasp combination, which is applied to a shell crown abutment. The tube is placed and soldered on the inner side of the lingual portion of the crown band and the occlusal portion of crown built up in inlay wax with the tube extending through the wax to the occlusal surface of the lingual cusp. The crown is then cast in the usual manner. A split pin provided with a lug on one side, about one-quarter its length, is fitted to the lingual side of the cusp, band and tube to allow pin to go to place with the lug extending lingually through the band. A clasp-metal clasp is fitted to the lingual portion of the crown, extending well over the exposed surface of the band from the occlusal to a safe distance from the gingiva. A slot is cut in the clasp to allow it to fit over the lug and hug close up to the band, after which the clasp is soldered to the lug, uniting the pin and clasp (by means of the lug), which allows them to slide on and off of the crown together, the pin in the tube, and the clasp outside the band.

The attachment operates both by friction of the split pin in the tube and the gripping of the clasp upon the lingual surface of the crown. The advantage of this attachment is that it does away with the bulkiness on the lingual surface of the abutment, so objectionable where the Roach or Morgan attachments are used in these cases. The construction and operation of the attachment were shown by drawings and models.

Arthur E. Smith. Nerve clinic. This clinic was together with the other progressive clinics, and covered the detailed technique of nerve-blocking. The technique was illustrated by the use of charts, skulls and wet anatomical specimens. The wet specimens were prepared by Dr. Smith especially for illustrating the technique for all nerve-blocking injections.

Two of the wet specimens were cut at various levels, in order to show the relationship of the various nerve branches to other anatomical structures. One specimen had been prepared by trephining away a portion of the temporal and malar bones, also the greater wing of the sphenoid, thus exposing the Gasserian ganglion, branches of the fifth cranial nerve, Meckel's ganglion, internal maxillary artery, etc.

Each nerve branch was traced out, showing the various anatomical parts supplied by same. The hypodermic needle was inserted into the specimens, showing the various movements and positions of the syringe in blocking the various nerve trunks.

Herbert A. Potts: Gave a talk and demonstration of conductive and local anasthesia. He also demonstrated deep alcoholic injection upon a wet specimen prepared by dissection for the occasion.

J. K. Conroy. Amalgam technique. Using quick-setting alloy in definite proportions in mortar, and stirring or triturated for three minutes, after which constant kneading in the hand while packing. Packed in steel moulds, first a large piece gently tapped to place to express the air, and then a thorough condensation at the cavity margins. After finished, filling withstood ten pounds air pressure on tank furnished by Dr. W. E. Harper.

J. E. Hinkins and L. L. Davis. Silicate fillings. It was demonstrated at this clinic that silicate fillings possess the five qualities for a practical filling material; namely, durability, insolubility, esthetic properties, ease of manipulation, small cost to the patient, and less nervous strain for the patient and the operator.

Dr. Arthur D. Black. Pathological Changes in the Peridental Membrane. This clinic consisted of a chalk talk on the progressive changes which occur in the investing tissues of the teeth in cases of chronic suppurative pericementitis and alveolar abscess. The specialized histological elements which are found in these tissues were first described, beginning with the gingivae. It was pointed out that the gingivae were so constructed as to enable them to withstand much abuse, being unusually well supplied with blood, so that new epithelium could be rapidly formed, and injuries quickly healed. Each of the several groups of fibers in the peridental membrane was described and its special function pointed out. Attention was called to the fact that the severance of the trans-septal fibers by suppuration would usually be followed by a separation of the teeth, and it would generally be impossible in such cases to restore and maintain contact.

The cementoblasts were described as the only cells which could form cementum; these cells are destroyed by suppurations involving the peridental membrane. Later on the fibers of the peridental membrane, extending from the area involved, gradually disappear, in part at least by the purely physiological process of absorption; and latetr the bone of the alveolar process to which these fibers were attached also disappears. Pus is formed in the space between the root and the detached tissue, and the cementum, which is porous, becomes saturated with the products of the suppurative process.

Therefore, in considering the prospects for re-attachment of tissue to the root in cases of suppurative pericementitis or chronic alveolar abscess, if we keep the above conditions in mind, we must conclude that it is practically impossible for reattachment to occur. We should undertake treatment with this in mind. We should also remember that both groups of cases present ideal conditions for systemic infection, viz., granulation tissue, containing many thin-walled blood vessels overlying or surrounding a pocket or cavity containing pus. In view of the present known relationship between these mouth conditions and many serious secondary systemic diseases, it becomes the imperative duty of each member of the dental profession to see to it that the mouths of his patients are free from such suppurations.

Fred W. Poyner. The purpose was to outline briefly and demonstrate the technique used in opening, cleansing and filling root canals. The full set of instruments required was mounted on a card.

To begin with, let us all fully realize that root canal work is surgery in the true sense of the word; therefore, it must be done in a surgically aseptic manner. Upon reaching the apex of a canal we are going deep into the body's tissues, and must avoid carrying infection, because what we put there is sealed in with no possible escape except into the general circulation.

All instruments and materials are sterilized by boiling, steam, hot air and gases, as the different materials permit. Formaldehyde gas is used for the gutta percha points and rubber dams. After being sterilized, the entire root canal outfit is kept in a separate airtight cabinet, with a slight trace of formalin gas to keep it sterile. Instruments and material are carried in trays from this cabinet for use at the chair. The fingers should touch nothing that enters the canal.

The rubber dam must always be used, and the enclosed teeth bathed with iodin followed by alcohol. The first requisite is sufficient access to the canals. This point cannot be too greatly emphasized, as the diagrams show it is impossible to reach around curves and enter small canals without making false pockets.

On lower molars the entire mesial cusps usually must be removed, on upper molars the buccal cusps. The entire roof of the pulp chamber must be removed before any attempt is made to enter a canal. If we begin feeling for a canal, then drill a little more, then probe again, all the grindings are forced into the canals before they are even exposed to view. The contents of the pulp chamber are not touched until the drilling is completed, or as nearly so as possible. A Roentgenogram is at hand to show the form of the root.

In single-rooted teeth and the large canal in molars, a smooth broach is inserted alongside the pulp tissue to the apex, rotated and moved about to form a passage for the barbed broach to follow. The barbed broach is then easily carried down without pushing the pulp tissue ahead of it. It is then rotated until the tissue is entangled in the barbs and removed; in this manner the entire pulp tissue comes out at once.

It is impossible to enter most of the small canals with a barbed broach. The finest spiral Young's aseptic broach is gently worked in as far as possible. Sodium and potassium are now carried to the orifice and pumped with the fine spiral. This digests or saponifies the organic matter. The combination of the two metals, sodium and potassium, when coming in contact with moisture, forms a strong caustic. If too much moisture is present, the combustion is violent—defeating the purpose. The natural moisture of the tissue is usually sufficient. As this is a powerful agent, it must be used with great care, a piece not larger than a pin-head, carried on a broach, and repeated until results are obtained. This is followed with a solution of sulphuric acid, twenty-five to forty per cent., for the purpose of enlarging the canals. (It also counteracts the action of the sodium and potassium.) The acid is carried on a Twentieth Century Adler broach. Files and finger drills are then used. When the canals are sufficiently enlarged, a saturated solution of bicarbonate of soda is pumped well in to neutralize the acid. The canals are next thoroughly dried with absorbent points and blasts of hot air.

The diagrams and pictures show lateral canals, connecting links and offshoots from the main canals. These cannot be cleaned by any mechanical means; chemicals must be resorted to, as ninety per cent of multi-rooted teeth are thus formed, and have multiple foramina; sodium and potassium are always used.

The teeth shown had already been prepared for filling, and the operator proceeded to fill the canals, using what is generally known as the Callahan method. The thin solution of resin and chloroform (xii grs. resin, iii drams chloroform) is carried into the canal with a Luer syringe, having a flexible gold or platinum point, pumped well to the apex with a fine spiral broach until the canal is flooded. The gutta percha cone which was subsequently taken from its alcohol bath and placed on sterile gauze to dry is now grasped in the pliers and carried to the canal. With a pumping motion it is dissolved in the chloroform, forcing the thin solution to the apex and into the small lateral canals and crevices. More points are dissolved and, if necessary, more chloroform and resin added until the canal is almost filled to the orifice. The chloroform gradually evaporates; the whole mass is packed with small canal pluggers until a solid homogeneous mass is obtained.

Next the pulp chamber is sealed with cement and a Roentgenogram made, to prove the work. No harm is done if the filling has flowed slightly over the apex. However if it has not reached that point, begin over again.

By the use of resin and chloroform (the Callahan method) is the only way in which the extra foramina and lateral extensions can be reached. It is not a radical change, as thought to be by many operators unfamiliar with it. The root filling is the same as we always used, chloropercha, only that it is mixed in the tooth instead of in a jar, and resin is present.

Dr. G. Walter Dittmar, Chicago. Clinician demonstrated by means of models some of the underlying principles of anatomical occlusion; also exhibited a device which was invented by one of his senior students at the University of Illinois, College of Dentistry, Mr. Roscoe W. Upp. This is an ingenious mechanism, driven by an electric lathe, and designed for grinding artificial dentures to perfect anatomical occlusion and articulation, while they are attached to an anatomical articulator, so adjusted that it will reproduce the movements of the mandible.

Dr. Wm. H. G. Logan, Chicago: By the use of charts and radiographs the following points were covered: Indications and contraindications for treatment of root-end infections through the root canal or the alveolar process for curettement or root amputation; outlining where extraction was indicated for the control of chronic periapical infection, calling particular attention to the advantage of ascertaining the blood pressure, hemanalysis and urinalysis as an aid in deciding for or against the retention of teeth about which chronic infection exists, rather than to rely solely upon radiographs and the usual clinical examination of the mouth.

Dr. John H. Hospers, Chicago. Clinician presented the subject of silicate cements, emphasizing the following points: Essentials of a good filling material. (1) Non-conductivity—least conductive, silicates. (2) Ease of insertion for both patient and operator. Silicate much easier than gold, amalgam or porcelain. (3) Color—silicate the best, except porcelain. (4) Strength still ranks low, but improving continually.

The main point of the clinic was to follow a certain procedure to obtain the greatest possible strength. The following points were brought forward and amplified:

(a) Be sure to seat the patient comfortably, as sitting is tiresome. (b) Have cavities prepared as painlessly as possible. (c) Always apply dam: (1) Have breathing holes; (2) instruct patient to breathe through mouth; (3) saliva ejector and paper pads under dam-holder.

You can leave even the frail tooth structure standing in exposed places, as the artificial enamel supporting it acts as a cushion, and is thus stronger than if it received the direct blow.

Physics tells us that when a filled bottle is dropped, the shock or force of the impact is transmitted to the contents of the bottle, and thus often saves it from breaking. Maybe the same law might be applied to the silicate supporting a badly undermined incisal angle.

Large contours can be built up in bicuspids and molars, feeling sure that they will give good results. However, make the restorations to tooth form, sloping the proximal surface from the contact point, and also cutting a groove in the occlusal, developing the marginal ridge.

Every silicate must be mixed according to the directions from the manufacturer, as it has its eccentricities, and unless we understand its manipulation it will never meet with success in our hands. Do not condemn an article because you do not know how to work it properly. It is like an automobile—you have to learn to drive it.

To Drs. John V. Conzett, Fred W. Gethro, C. A. Dodge, Karl G. Knoche and James H. Prothero, who did not report their respective clinics, but who gave of their broad knowledge enough to make the trip to Springfield well worth while, the Clinic Committee extends the appreciation of those in attendance.

The Progressive Clinic was lauded highly and proved itself a big factor in the success of the State Meeting.

NORTH SHORE BRANCH OF THE CHICAGO DENTAL SOCIETY.

Meeting of the North Shore Branch of the Chicago Dental Society, held at the Winona Gardens, 5120 Broadway, Chicago, on Monday evening, October 2, 1916, at eight o'clock.

President Edmund Noyes presiding.

Dr. Floyd A. Leach read a paper on "Radiographic Findings in Cases of Apical Infections," followed by the exhibition of lantern slides.

DISCUSSION.

Dr. T. L. Gilmer:

What I shall have to say will necessarily be somewhat rambling, and if I do not follow the paper closely it will be due to the fact that the paper has been so comprehensive that it will be difficult to do this. I do not suppose that there is one here who does not value radiography. Nothing, to my mind, has come either to the medical or dental profession, since the time of Lister, which equals the benefits derived from radiography and its value seems to increase as time goes on.

I may state as a matter of history, especially in connection with Dr. Fuchs, who lost his life as the result of his work with the X-rays, that almost immediately after he commenced his work in Chicago, Dr. L. L. McArthur, the surgeon, made use of it, and recommended its use to me in oral surgery. I immediately employed it in two cases; one was a dentigerous cyst of the upper jaw, the other an impacted lower third molar. These were the first pictures Dr. Fuchs made of the jaws. Dr. Frederick Noyes made photographs from both of these cases, and engravings from these photographs appear in the first edition of my small work on "Oral Surgery," published many years ago.

I did not at the time conceive of the value that was to come to the dentist from radiograms, not realizing that in a few years we would be using them daily, and must use them if we practiced dentistry in a scientific and progressive manner. I do not know who made the first radiograms of the roots of teeth to determine their condition, probably those mentioned by the essayist.

Radiographs may lead one astray. It is not always easy to read them. I have had two pictures made by the same radiographer, of the same root; one showed an abscess, the other did not. Why? It is the difference in the angle of exposure. In some instances rarifications are shown about upper incisor teeth which are not abscessed, due to a less density of bone in such areas. If we find a rarification in the apical area of a root, which has a well defined outline, we may be very sure that an abscess exists. Mistakes are sometimes made in reading radiographs of the lower jaw, the inferior dental foramen being mistaken for an abscess. I have seen radiographs of the posterior portion of the mandible where outlines of the roots of the teeth were not shown, even after several attempts had been made by good radiographers. This is due to an unusual thickness and density of the overlying bone.

That part of the peridental membrane in the apical space is a highly organized tissue, therefore is unusually liable to injury. I do not believe that any root whose peridental membrane has been destroyed, even though the area be slight, is ever safe unless the dead portion of the root be excised. A root abscess may, in many instances, be cured for a time by medication, even if a part of its covering be destroyed, but unless all of the necrosed portion of the root be excised, inflammation must again, sooner or later, recur, since bacteria will again be brought there by the blood stream. A small abscess may be as dangerous as a larger one, since if pyogenic organisms are there, they may escape and go elsewhere and cause trouble regardless of their numbers.

When a pulp has been thoroughly destroyed with arsenic, it is almost certain that a portion of the peridental membrane will be destroyed as well. The action of arsenic cannot be limited. It is one of the most destructive substances to the tissues known. Other caustic drugs are nearly as bad, and have no place in the roots of teeth. Some years ago in Northwestern University Dental School, Dr. Black excluded all treatments for canals which were irritating, using principally salt solution for cleansing, with improved result.

Are we ever justified in the destruction of healthy pulps in teeth? I doubt it. I have seen as a consequence many bad results. Recently a man came under my observation who had a blood pressure of 240, besides he was ill otherwise. Radiographs made of his teeth showed infections in the lower molars, in one of the bicuspids on either side, and one or two in the upper jaw, also the incisors of the lower jaw. The patient's physical condition was such that I deemed it necessary to remove the diseased teeth. Not willing to do the prosthetic work necessary to restore the lost teeth, the patient went to a dentist of his acquaintance for the service. I saw the patient later and discovered that the dentist had replaced the posterior teeth on a plate, but had cut off the sound cuspids which I had left, destroyed their pulps, using them as piers for a bridge for the anterior teeth. Now what will happen to these roots is a pertinent question. To my mind it was a wicked procedure.

Early in my experience we capped many pulps. We quit it later because so many of them died, but a certain percentage of them lived. I had a tooth in my own mouth which had an exposed pulp. This was in 1871 when I was in college. The pulp was capped by one of my classmates. It remained alive until last May. Dr. G. V. Black capped an exposed pulp for me in 1873. It lived for forty-two years and Dr. Gethro had some difficulty in destroying that part of the pulp remaining alive in the distal root after the death of that portion in the mesial canals. In each instance these pulps died as a result of leaky fillings. I believe we should cap pulps if there is any possibility of saving them. I have saved the pulp of many teeth by capping, but one must use good discrimination in the selection of cases and use a delicate technique.

Dr. William H. G. Logan:

Dr. Leach's paper has made certain statements in reference to this entire problem of mouth infections which may be summed up as follows. The first proposition that dental pulps should not be needlessly destroyed is a position every one should take. In reference to pulp capping, this question was brought up in the discussion. Personally, if I found a pulp exposed by dental caries I would believe it was an infected pulp. I do not believe you can permanently save the vitality of a pulp that has been in contact with decalcified dentin. I believe the great percentage of successes in capping pulps has been confined to pulps capped in early adolescence before the root end had fully and perfectly formed. The pulp capping I did successfully was done in the young person and not in the old patients.

The next question to be taken up is the statement that the root end of pulpless teeth decalcifies and thereby increases the apical space, also a variation in the penetration of this root by X-rays.

It is a new contention to me that the root end decalcifies when the pulp is taken out. I would desire something more than the X-ray to prove that statement. I would want this proof demonstrated under the microscope.

One of the pictures shown upon the screen was that of a certain lower molar which the essayist did not believe could be the cause of the neuritis, so they undertook to treat the tooth and not being able to pass to the root end it was extracted. The neuritis cleared up, which goes to prove the point made by Dr. Gilmer that it is not the size of the infected rarefied area but that a confined infection is present. The problem is to consider the affected area at the root end and the question is its proper treatment. This I believe is accountable for the large attendance this evening. What are you going to do about it? That is the real problem. When can you treat a tooth and when can you not treat a tooth successfully that has an infection of the root end? That is what you are here for and I do not know that I can answer it.

Personally, I do not believe that a tooth having an infection at the root end and the apical pericemental membrane destroyed can ever be safely left in the mouth without amputation and root amputation is only indicated in the most favorable cases.

If in the reading of radiographs you cannot make out the root end has pericemental membrane over it, I believe you have a tooth that cannot be saved by treating through the root canal and extraction is demanded unless you can perform a successful surgical operation that terminates with the removal of the exposed root end and the filling in of the lost area with normal tissue cells. Therefore, in the reading of radiographs, pay particular attention to see if there is an apical pericemental membrane left.

What about root amputations? When are they indicated? If the patient is in average good health, and if everything is favorable so far as the patient is concerned, I believe you can take off less than a third of the root end of the upper bicuspid and six anterior teeth, but when you remove more than a third of the root you pass beyond what is favorable. Occasionally it is good judgment to amputate the root end of one of the upper molars, but I would not advise root amputation of the lower molars although it is easily accomplished. In reference to the lower bicuspids I have practically discontinued to excise these root ends. One can successfully amputate the root ends of the lower incisors and cuspids in favorable cases. I feel that one is seldom justified in cutting off the root of a tooth for a patient who has a serious secondary involvement which is possibly due to the infection confined to this periapical space. If the patient has a heart, joint or kidney lesion or any other serious disturbance that comes from such a focal infection, it is wiser to take that tooth out than to cut off the end of the root, because you do not get the pericemental membrane formed over the end of the remaining root. It is always questionable to cut off the end of any root.

In reference to the picture shown tonight in which the root ends have been cut off for many years and where the speaker said he did not know what the large rarefied area meant; I said to Dr. Gilmer that I would interpret it as infection immediately above the root end and he said "yes." I believe there was a definite root infection right above the root end of each of the teeth shown in that particular picture.

Mouth infections have to be controlled by the dentist. We have passed the time when we can complain about the physician making mistakes in diagnosis, for the responsibility of mouth infections belongs to the dentist and you must treat them. I do not believe in extracting all pulpless teeth that come to you, but you must extract them unless you can control their associated infections. It is a very large problem to take a mouth and find out what should be done for the various teeth in the mouth which have root canal fillings in them. I will wager that Dr. Gilmer day after day comes in contact with cases upon which, even after all his years of experience he hesitates to pass an opinion. I do not believe any man can take a radiograph and from that alone decide what ought to be done in many cases. He must consider the patient's health, the mouth, the radiograph and he must get as much of the history of the patient as he can. If five or six teeth have chronic infection at the root ends, it is unwise to have them all taken out at one time, for fear of the serious effect which frequently follows the extraction of too many teeth having chronic infection at their root ends; for as a result it will some day happen that your patient will be put to bed and may remain there for a long time and may never get up. My advice is extract a few of these teeth at a time.

What has been the outcome of this whole subject? There have been gradually developing in this city men who are specialists in mouth infections. Men are growing to be known as having special knowledge of mouth infections. If a medical man suspects an infection in the nose or any of the accessory sinuses that internal medicine man would not tell the patient to go back to his physician and find out if there was an infection in any of his sinuses or throat, but he would refer him to the nose and throat specialist. You men cannot expect to be competent in every line and all the sub-lines of dentistry. The result will be that you will send your patients to some one who does these things daily. But the man who works specially in mouth infections will be a definite man in your community and he has a very large problem to solve. The dentist who thinks he can solve this problem together with all other problems in operative mechanical dentistry will surely fail.

In closing allow me to leave this thought—do not leave a known infection at root ends because the patient is seemingly in good health for your full duty as professional men will only be accomplished when chronic infections of the mouth are eradicated by the dental profession regardless of the condition of the patient.

Dr. H. A. Potts:

Dr. Logan, I believe, has not gone far enough. He has spoken about these infections. How do you know that these rarefactions and dark spaces at the roots of teeth as shown by the radiograph, are infections? Because they have been proven to be infections, or the result of infection. Infections from what organisms? In the vast majority of cases, of anaerobic organisms. The streptococcus viridans and the streptococcus hemolyticus play the greater part. They do not grow rapidly. These infections have been proven to be the cause of systemic disorders which have led many persons into an early grave. Many diseases of the interior of the eye are secondary and there is a primary focus somewhere.

Leaving the arguments pro and con out of the question, it has been proven that these infections are serious matters for the patient. Their general health and even their lives are influenced by these infections. How are you going to tell whether these pulpless roots are infected or not? We *have* abscesses of infected granulomata at the apices of teeth which have lost their pulps and we do *not* have them at the apices of roots having live pulps. A patient with a pulpless tooth is in danger. These infections are of slow growth, and have probably been right there and just as dangerous to the patient, because the size of the cavity does not govern the virility of the micro-organisms. The patient may have been suffering for ten years from a focus of infection, without any rarefaction of bone.

A woman with a deforming arthritis came to me two years ago; she was practically an invalid. A number of infected granulomata were taken out. Simple extraction was not sufficient. Curettment and packing, and healing with plenty of oxygen present are necessary. The patient improved, with the eradication of the demonstrable foci, but she was not entirely cured. Two months ago she returned, as bad as ever. The skiagraph revealed a very small granular area at a lower bicuspid apex. The second bicuspid showed negative, with a continuous line of the bony socket. The line of the peridental membrane was not widened and was seemingly negative. I decided to take out all the pulpless teeth. The lower first bicuspid was extracted and a culture, under strict aseptic precautions was made, withdrawing the material by means of a sterile capillary tube and sealing it immediately afterward. The examination of the tooth revealed a lopsided granuloma on the side which was obstructed by the root. I took out the other tooth, which was perfectly clean, and from a perfectly clean socket, made a culture from that in the same manner as from the other. Then a careful examination of the socket of this second bicuspid was made with perfect control of light conditions. The socket seemed to be perfectly normal. From the first bicuspid was obtained a pure culture of streptococcus viridans. From the second was a mixed culture of streptococcus viridans and streptococcus hemolyticus. Both the pulps were dead.

Two years ago, in endeavoring to cure this same patient I had amputated the apices of both central incisors, with a perfect surgical result. Healing was rapid, the scar was contracted, the teeth were not sensitive, the mucous membrane in the region was pink and normal. I took out these teeth. There had been new bone deposited at the site of the amputation. They came away clean, but in one little corner there was a little red tissue. I made a culture from both of those sockets and found streptococcus hemolyticus in both of them.

What are we going to do with the root amputations if that is going to keep up? We have been treating teeth and not patients. When you are treating teeth remember the health of the individual, because you may be directly responsible for it as well as these *acute* infections which can be demonstrated. How about arterio sclerosis, which we believe is due to a chronic infection? The gastro-intestinal tract has been accused of being the cause of much arterio sclerosis, but we have not gone far in the treatment of it. Arterio sclerosis is a fore-runner of apoplexy. High blood pressure and Bright's disease come in the same category. While it is not proven, indications point toward these chronic infections as etiological factors.

Dr. F. B. Noyes:

A prominent medical man reminded us that life is a combat between the individual and infection, and that in the end infection wins. During health the resistance of the individual will successfully combat the infection. During depression or exhaustion or exposure to cold or heat or any condition which temporarily lowers the vitality, the infection will temporarily be on top, but in the end the infection wins. That should be constantly borne in mind, for that is what it means to leave a danger point from which at a time of lowered resistance the infection spreads; and sometimes at one of those times of lowered infection that spreading reaches a spot which puts the individual in his grave.

I want to say one thing with reference to radiographs. No radiograph should be attempted to be read which is not accurate and sharp enough to show the minute structure of the tissue. You should never attempt to make a diagnosis from a radiograph which does not show the details of the bony structure, which does not show the outline of the cribriform plate and the socket. Otherwise you have no basis for your judgment. There is nothing which would help men in reading radiographs as much as to dissect the jaws of a sheep, to dissect out the sockets and the relations of the cribriform plate, etc. It will open up the meaning of the entire subject. You will realize that the source of the infection at the apex of a tooth is in the region in which the absorption has the greatest possible advantage. The entire structure of that tissue is open to the spread of infection. You will be able to interpret your radiographs so much better from that simple study, that it is well worth while for every individual to make it for himself. No one else can make it for him. You do not sense this, it does not become a part of your experience until you work those tissues over for yourself.

Dr. Kirby:

A man should be honest with himself. At our dental meetings, every prominent man is telling us the same story which we have heard tonight, that we cannot leave pulpless teeth in the jaw. I have got to live a lie with myself until the public becomes educated or the dental profession is willing to be honest with this truth, that we cannot leave a pulpless tooth in the jaw. I wish Dr. Logan had told us just where we are. We want to know what we are going to do with these cases. The X-ray has put them up to us, and I for one am in the deepest mire. Daily I have such teeth, and I have not as yet the nerve to extract them. The only suggestion that I have been able to furnish myself is that whenever I get to the point where I will observe surgical cleanliness in my root canal work I will have my conscience a little easier, although my intellect tells me that I am in the same condition as when we say we cannot take this pulp out and be safe.

Dr. E. L. Graves:

Pulps of teeth can be capped at any age, even after years of exposure, if the man knows enough to treat them. I saw them capped by Dr. Fitch in New York City in 1870, and I have been treating and capping them from 1871 myself successfully; and it can be done. I have capped those which have been exposed for six years.

Dr. Logan:

There is a very intelligent young man in another city, who is carrying on this experimental work in animals, taking out portions of the pulp down in the pulp chamber. In others he is taking out the pulps, leaving them exposed, and he is treating the pulps in animals. There is a good deal of careful work being carried on at this time. I do not know what the outcome will be, but I know this work is being carried on.

Dr. Knowles:

I would like to ask how many pulpless teeth which show rarefying areas there are which demand extraction? Three pulpless teeth out of ten may show rarefied areas. They ought to be taken out. The other seven may be all right and are left. There are cases where pulpless teeth may be left, where they remain healthy. The question is whether these diseased conditions are not the result of improper technique, which technique, as Best of Minneapolis has shown, can be improved upon. I have seen many pictures which show conditions which are all right, as far as the continuity of the bone is concerned. It is not until there is a space there that it is considered unsafe. I would like to know what percentage of pulpless teeth should be taken out and what percentage should be left. We must have mouth restorations. Grinding surfaces are necessary to health. We are in a difficult position.

President Edmund Noyes:

One aspect of this matter has not been brought out clearly, and that is the relation of these cases which come into our offices, to the health of the patients. You would think of a pulpless tooth which showed no evidence of injurious condition under the X-ray, in the same light if the patient were in perfect health, as you would if the patient had some systemic disease which might be the result of some focal infection. You would take out the teeth which were suspicious. In the case of perfect health you would wait for something more decisive.

Dr. Gilmer:

Dr. Frederick Noyes spoke of immunity and susceptibility. That is the whole thing. One may be immune for a long time and be able to counteract the poisons from abscessed teeth, but later he may become susceptible and be poisoned by them. This is equally true of infections in other parts of the body. Physicians at the present advise eradication not only of abscessed teeth, but all infections wherever found in the body.

Every root which has an apical abscess is a possible danger to an individual who has it, but it may not be a danger so long as his physical condition is up to par. Patients having such teeth should be kept under observation. Efforts should always be made to keep root canals aseptic, to prevent future trouble. Surgical cleanliness must be observed in the treatment of root canals but even though a root canal be made thoroughly aseptic and filled, it may not always remain free from infection. If the root is partially denuded of its peridental membrane, it will not remain indefinitely aseptic. In answer to the question, what may be employed instead of bridges, which demand destruction of pulps for their insertion, would answer, make small gold plates. Bridges can be made for posterior teeth without destroying their pulps by using bands and cementing them to the teeth. Farther forward small gold plates should be employed. Such methods may not be wholly satisfactory, still they are safer than bridges when pulps of teeth must be destroyed for their insertion.

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EDITORIAL.

LOOK OUT FOR THE POCKETS.

If we are to cure pyorrhea alveolaris we must check it in the beginning, and if we are to check it we must recognize it in its earliest stages. Too frequently even in the hands of reputable and conscientious practitioners deep pockets are permitted to pass unnoticed till they have worked serious injury. A tooth may be perfectly firm, the gum may be a good color around it, with no hypertrophy or other surface indication that anything is wrong, and yet there may exist along one side of the root a pocket leading half way to the apex. Something has lodged under the gum—something too small to cause sufficient irritation to make the gum swell, but enough to encroach on the pericemental membrane and produce its absorption; or else the occlusion is faulty and the tooth is being unduly pounded against the side of the membrane till its attachment to the process is destroyed at this point. The patient knows nothing about the condition, and the only possible means of detecting it before irreparable damage is done lies with the dentist. During an examination of the teeth for caries or other troubles, and particularly during a removal of deposits and so-called prophylactic treatment, a very careful search should be made with a fine probe or explorer, passing it around each tooth under the gum and seeking out any possible pocket that may exist. It will be a revelation to those who have not made these examinations in a painstaking manner to learn how very many of these pockets exist in mouths where a mere surface observation would indicate that everything was normal. Wherever the gum and pericementum are detached from the root of the tooth even for a short distance the matter should be investigated and the cause removed. It may be a very thin scale of serumal calculus creeping along the root, which though possibly secondary to some original source of irritation in the gum, should be thoroughly removed and the root surface most carefully smoothed.

It seems logical to believe that in many of these cases the serumal calculus is not the first cause of these gum degenerations, but when once formed it proves a constant irritant, and the gum will never return to normality while it is there. If a pocket exists on one side of a root only it is well to look carefully into the local cause. If between the teeth it may have been started by the lodgment of food in the interproximal space, and this should be looked into. If on the buccal or lingual sides of the roots there may have been some trauma to account for it. In any event the significant thing is to detect these pockets early and eradicate them. If the entire profession would do its full duty in this important particular it would check many cases of incipient pyorrhea and leave the mouths of patients healthier. No mouth in adult life need ever be considered safe against the possibility of pockets starting under the gum, and thus every mouth should be searched carefully for them.

THE BLACK MEMORIAL.

At the 1916 meeting of the National Dental Association a committee was appointed to arrange for a suitable memorial to be erected to Dr. G. V. Black in commemoration of his signal service to the profession and to humanity. Similar action having been previously taken and a committee appointed by the Illinois State Dental Society, the same men were appointed to act for the National Dental Association.

This is a matter of interest not only to the membership of these two organizations but to the entire profession. Dr. Black's name is known wherever dentistry is known, and every man or woman practicing today is doing it better because of the life and work of this man. He was one of the commanding figures of all time in dentistry, and it is therefore very fitting that the profession should take cognizance of his worth in this manner. The committee is desirous of having every practicing dentist represented in this movement, and has asked for contributions of only two or three dollars each, except of course that great admirers or personal friends of Dr. Black will want to contribute more than this, which the committee will be glad to accept. The hope is that with this plan the list of contributors will be representative of the dentists in practice during the present decade, the plan being to have the list preserved in permanent form by publishing the names in the *Journal of the National Dental Association*, by placing them in the library of the Northwestern University Dental School, and by enclosing them within the cornerstone of the memorial. The committee consists of Dr. W. H. G. Logan, chairman; Drs. T. L. Gilmer, F. B. Moorehead, E. K. Blair and C. N. Johnson.

To make the committee's work as effective and economical as possible, so that every dollar received may be available for the memorial, only one appeal will be made for contributions. If the reader of this has received a circular and has not yet contributed, let him do so at once before the matter escapes his attention. Checks may be sent to the chairman, 29 East Madison street, Chicago, Ill.

THE EDITOR'S DESK.

I WOULDN'T.

If I were you I wouldn't hold resentment—it doesn't pay And that is not the only reason why I wouldn't. It is not manly or big, or brave, or right to hold resentment. It doesn't contribute to happiness, or create harmony, or help humanity. It harms yourself more than anybody else, but you are not the only one it harms. It is a canker eating into your very soul and souring the sweetness of life—your own and others. It is never constructive, but always destroys, blights and blasts. You never "get even" with people who wrong you without lowering your own manhood.

I wouldn't answer an abusive or unreasonable letter the same day I received it. It is always best to wait till the first flush of vexation is over, when the calmness of contemplation shall have soothed the irritated nerves and permitted reason and charity to ascend the throne. I would wait till the mood of conciliation came to my rescue, and if this mood did not come I would never answer the letter. It is better not to write at all than to write in kind when you are made the victim of an unjust attack.

I wouldn't turn my back on the poorest pilgrim who ever trod the earth if I could be of help, but help is of various kinds. The best help is to help others to help themselves; the most pernicious help is that which creates dependence, and makes the recipient more helpless.

I wouldn't judge an act without knowing the motive, and I wouldn't judge a motive without knowing the facts. Even so, truth is more subtle than fact, and I should want to go farther and know the truth. Then I wouldn't judge without thinking twice, and after I had thought twice I should hope that I wouldn't judge at all.

I wouldn't weep over the unavoidable. Hard as it sometimes seems, it is never made easier by lamenting, and the energy used in regrets is worse than wasted.

I wouldn't wish too much for wealth; instead of wishing and waiting I would go out and get it. Wealth is wonderful when it is properly used, but the struggle for wealth merely for the wealth's sake is folly.

I wouldn't be worse than a bear; a bear is true to his friends, and honorable with his enemies. He never goes out of his way to look for trouble nor does he shirk it when it comes. He is for the most part a better philosopher than you or I.

I wouldn't weave a web of imaginary wrong and embroider somebody's name on it; I would wear my true colors and look every man in the face.

I wouldn't willingly give offense to the most offensive; I wouldn't retaliate with the most treacherous; I wouldn't fawn on the most effusive.

I wouldn't live a life of distrust, or doubt, or suspicion, or envy, or hate. I would live out in the open with the sunlight of heaven bathing my brow, and my heart attuned to the beneficence and grandeur of the spheres.

I would't spend my energy in righting fancied wrongs, or in reforming those who are better than I. I wouldn't preach reform, and practice perfidy, and meanness and deceit.

I wouldn't set myself up as an example to others till first I had proved that I was better than others, and, second, that others needed an example.

I wouldn't harbor a mean thought lest that thought turn on me and rend me like an inward claw.

I wouldn't yield my sovereignty of soul to the lure of worldly lust, nor float on the tide of a false faith to escape the duty of good works. I wouldn't hide behind a belief unless that belief were backed by deeds, and I wouldn't lament even though I could not believe if only I were permitted the privilege of doing.

And last of all I wouldn't flaunt my troubles to the world, but baring my breast to the blast I would resolutely face the portion which fate had in store for me, and plod patiently on to the end of the winding road.

LETTERS TO A RECENT GRADUATE.

Beginning in the January number I propose to start in this department a series of open letters to a recent graduate. They will deal with some of the things which I deem essential to success, and will run at least half a year. I can only hope that they may do sufficient good to justify their publication.

BOOK REVIEWS

DENTAL AND ORAL RADIOGRAPHY. A text-book for Students and Practitioners of Dentistry. By JAMES DAVID McCOY, D. D. S., Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles, California. Seventy-one illustrations. 157 pages. Price $2.00. Published by C. V. Mosby Company, St. Louis, Mo.

Here is a book we have all been wanting. As the author says, "It is essentially a book for beginners," and the further inference is that most dentists are beginners in this important work, and therefore it is a book for most dentists. The author has not made the mistake that too many authors do, viz., taking too much for granted as to his reader's knowledge of the subject. He goes into the subject at the very foundation and works it up in a logical sequence till the practical application is made in the mouth. It is a workable, readable book, carefully prepared and beautifully printed. It is well worth the modest price that is asked for it, and should be in the hands of every progressive practitioner.

A TEXT-BOOK OF PHYSIOLOGY. BY WILLIAM D. FOETHOUT, Ph. D., Professor of Physiology in the Chicago College of Dental Surgery, and in the Chicago College of Medicine and Surgery, Chicago. 543 pages. Published by the Bogarte Book Company, Valparaiso, Indiana.

In this work the author has aimed to condense his subjects within the grasp of the student, and in consideration of the crowded condition of the college curriculum. He goes straight to the essence of the matter, leaving out abstract or irrelevant things, and treats only of those subjects which appeal to him as of importance to students. And yet all the essentials of physiology are amply discussed, such as circulation, respiration, food and digestion, absorption, metabolism, the central nervous system, reproduction, etc. The chapter on Respiration is particularly good and it is stated in such clear and understandable language that even a layman may follow it. In fact the whole book is written so plainly and entertainingly that it is a pleasure to read it. Practitioners as well as students will find this work well worth the time spent in its perusal.

ORAL ABSCESSES. By KURT H. THOMA, D. M. D., Lecturer on Oral Histology and Pathology, and Member of the Research Department of Harvard University Dental School, Instructor in Dental Anatomy, Harvard Medical School, Oral Surgeon to the Robert B. Brigham Hospital, Visiting Dental Surgeon to the Long Island Hospital, Consulting Oral Surgeon to the Boston Dispensary. Profusely illustrated, some with colored plates. 213 pages. Published by Ritter and Company, Boston, Mass., 1916.

The author deals first with the Phenomena of Infection, and carries the subject on down through the history of alveolar abscesses, their pathological development, their bacteriology, the secondary complications, and the treatment. It is by far the most complete work on the subject that we have seen dealing with all its phases and entering carefully into a consideration of the relationship between focal infections in the jaws and other bodily ills. Among many very striking illustrations we are shown several cases of rare impactions of teeth leading to abscess—teeth far removed from the vicinity of the arch; in one case behind the antrum of the upper jaw, and in another in the angle of the lower jaw. The work as a whole is intensely interesting, and the author is to be commended for bringing together in this most comprehensive manner all of the available knowledge on this very important subject. We bespeak for it a very extended sale.

MOUTH HYGIENE. A Course of Instruction for Dental Hygienists. A Text-Book Containing the Fundamentals for Prophylactic Operation. Compiled by ALFRED C. FONES, D. D. S., Bridgeport, Conn., Edited by EDWARD C. KIRK, Sc. D., D. D. S., LL. D., ROB'T H. W. STRANG, M. D., D. D. S., and ALFRED C. FONES, D. D. S. Octavo, 530 pages, with 278 engravings and 7 plates Cloth, $5.00 *net*. Lea & Febiger, Publishers, Philadelphia and New York, 1916.

Here is a book quite unique in dental literature. It is the outcome of a course of lectures delivered to classes of young women at Bridgeport, Conn., to train them for dental hygienists. Dr. Fones conceived the idea and with the help of the contributors to this book has carried it out to a successful issue. There are nineteen contributors in all, and they stand for the very best there is in dentistry and medicine. The book is made up of lectures given the class, and carefully revised by the lecturers. The list of subjects treated is very comprehensive, it evidently having been the idea of the compiler that in order to accomplish anything worth while in this work it should be placed on a broad basis of instruction. A few of the chapter heads are, Anatomy, Physiology, Bacteriology and Sterilization, Inflammation, Deposits and Accretions upon the Teeth, Dental Caries, Pyorrhea Alveolaris, Dental Prophylaxis, Factors in Personal Hygiene, Fresh Air and Correct Posture in Their Relation to Hygiene, etc., etc. It will thus be seen that some of the most important matters connected with dentistry are considered, and all in a very masterly way. The book is to be endorsed most highly.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

A Good Water Syringe:—An ordinary chip blower with a different colored bulb makes a fine water syringe. Fill by atmospheric pressure.—*F. A. W.*

To Remove Rubber From Cloth:—When rubber adheres to the cloth, dip a sponge in cold water, and pass back and forth over the cloth, until freely saturated, after which it will easily peel off.—*J. M. H.*

Lubricating Disks:—When the sandpaper disk sticks between the teeth, just lubricate both sides—the shellaced side as well as the cutting side—and it will work beautifully.—*James W. Cormany, Mount Carroll, Ill.*

Temporary or Deciduous Teeth:—These teeth play a very important part in the future eruption of the permanents, and should be kept in children's jaws, so long as they are not a positive menace to health. Hence early attention to children's teeth are paramount, from health reasons, proper maintenance of space for eruption of permanents, and for orthodontic reasons.—*Grafton Munroe, Springfield, Ill.*

Anchor to One Tooth Only:—In getting away from the gold crown anchorages for bridges many failures have resulted with inlays used for the same purpose. A large percentage of these failures can be entirely overcome by a radical change in the methods of making the bridge. In all cases where but a single incisor, cuspid or bicuspid is missing, anchor the porcelain tooth to but *one tooth* instead of one on each side. Strange as it may seem, half anchorage like this will hold far better than the usual double attachment. The reason is very simple—the dummy tooth moves slightly—as all teeth do, with the one tooth to which it is attached, and has no tendency to break away from the opposite side.—*Arthur G. Smith, Peoria, Ill.*

To Cast Gold Bands:—To cast a band for a tooth take a good impression of the tooth and run a model. Cut off all other teeth from the model except the one to be fitted. Make a Mellotte's metal die. When the die is cold apply hot wax in repeated layers with a camel's hair brush until the desired thickness is obtained. Then trim and remove on a sprue, invest and cast. After the casting is made it can be reduced by boiling in a test tube with a little nitro-hydrochloric acid to counteract the shrinkage.—*Frederick N. Stephan, Chicago, Ill.*

Arsenic Devitalization:—For a number of years I have used the following method of pulp devitalization where arsenic was indicated. Place small amounts of arsenious acid (white oxid), phenol crystals and chlorotone (Parke Davis) upon a glass mixing slab kept especially for the purpose. Mix the phenol crystals and the chlorotone together, which, upon deliquescence, will form a liquid. Add the arsenic to form a paste and apply directly to exposed pulp or as near to it as possible and seal with Pro Tem. The phenol and the chlorotone both having anochine or slight anesthetic properties, control in a large degree the irritating effects of the arsenic without nullifying its efficiency. The advantages in using this method are, first, devitalization accomplished quickly with little or no pain in most cases, if properly applied; second, as the paste contains no drugs which are under the ban of the Harrison drug act, you save yourself both trouble and expense.—*C. W. Coltrin, Chicago, Ill.*

A Good Substitute for Porcelain Faced Crown:—A good substitute for a crown of any of the upper incisors when there is not sufficient time to prepare the root in the ordinary way is made as follows: Remove carious dentin and ream out pulp canal and approximately trim enamel walls. Fit dental alloy post to root canal, leaving post long enough to extend to the incisor edge of tooth. Remove post and solder piece of 22-karat gold to post, making it T shaped. The post is now cemented into place, the cross piece of gold extending mesio-distally. After cement has set, the rubber dam being in place, the body of the tooth is built up with any good silicate cement, the cross piece of 22-karat gold forming the incisor edge. The whole procedure occupies a very short time, and although not recommended as general practice, I believe a crown constructed in this way will last indefinitely and will often tide over a difficulty where the accidental breaking of a tooth necessitates the immediate restoration of the crown in the case of public speakers, etc.—*A. G. Salisbury, Takaka, New Zealand.*

Cutting Cavities in Artificial Teeth:—To prepare cavities in porcelain teeth take a small worn out engine bur, grind bur off to a sharp point, drive point through a piece of german silver plate 31 gauge, about one-quarter inch square. While it holds tight solder to shank of bur with either gold or german silver solder, trim the corners off hexagon shape, leaving about one-sixteenth inch from shank to edge of disk. Now take an old engine stone and powder with a hammer and keep in small box. One stone will last a lifetime. Prepare outline of cavity margins with engine stone, then put in disk mandrel and dip in oil or water and then in the powder. The disk if not pressed too hard against the porcelain will drag the cast powder under it and cut as good a cavity as a diamond drill and just as quickly and costs you nothing. Make five or six while making them. Press the tooth or crown to be prepared in a small piece of modeling compound, warmed, and have portion of tooth to be worked on elevated above the compound. Fill tooth without removing and finish.—*W. C. Shallanberger, Chicago, Ill.*

MEMORANDA

MINNESOTA STATE DENTAL ASSOCIATION.

The thirty-fourth annual convention of the Minnesota State Dental Association will be held February 23rd and 24th, 1917, at the University of Minnesota, Minneapolis, Minn.—Max E. Ernst, Secretary, 541 Lowry Bldg., St. Paul, Minn.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

The next annual meeting of the American Institute of Dental Teachers will be held at Hotel Adelphi, Philadelphia, Pa., January 23, 24, 25, 1917. A number of papers, reports and discussions relating especially to dental education will mark this meeting. All dental teachers are cordially invited to be present.—Abram Hoffman, Secretary, 529 Franklin Street, Buffalo, N. Y.

Boston, Nov. 2, 1916.

Dr. C. N. Johnson, Editor Dental Review,
810 Masonic Temple, Chicago, Ill.

Dear Doctor Johnson: I am writing to advise you that at the last meeting of the Board of Trustees of the Forsyth Dental Infirmary it was voted that the Library and Museum be established as a definite department of the Infirmary and the same placed under the immediate supervision of a Librarian and Curator and Dr. Frederick Keyes of Boston was appointed to the new position. It is expected that this department will be developed to a high degree and that it will take second place to none.—Very truly yours, Harold DeCross, Director.

ANNUAL MEETING OF THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

The annual meeting of the above Association will be held at the Palmer House, corner of State and Monroe Streets, Chicago, Illinois, on December 18, 1916, at 4 P. M. A report of the officers will be given; the election of a board of directors will be held; and such other business transacted as should come before the Association at this time.

All members are urgently requested to be present.

By order of the Board of Directors.

J. G. Reid, President.
J. P. Buckley, Vice President and Secretary.
D. M. Gallie, Treasurer.

AN ANCIENT ADVERTISEMENT.

Through the kindness of Dr. Edmund Noyes we are permitted to reproduce the following unique advertisement from *Notes and Queries,* of London, taken from the *Covent Garden Journal* of April 18, 1752.

"At the Two Heads in Coventry Street, between Picadilly and Leicester Fields, all Persons of what Age, Sex, or Condition soever, who have had the Misfortune of losing their Teeth, or only Part of them, but more particularly their Front ones, by any accidental Blow or Fall, or Thro Decay of their Teeth or Gums, to the great Disfigurement of their Mouth, and Interruption of their Speech and Pronunciation may have such Deficiencies replaced with Artificial ones so admirably adapted as to serve every Use of natural ones, and no way Painful or Discernible, they being made, fitted, and set, after an entirely new Method, never before put in Practice by any other than Paul Tullion, operator for the Teeth, at the above place, who is the only and Sole Inventor of Them."

THE PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

This organization is meeting with great success. Study units, in conformity with Army requirements, are being established in principal cities. Its purpose is to prepare Dental Surgeons for Army service in time of need. This organization has the hearty support of the Government, and much beneficial legislature governing the Army Dentist is sure to result.

This organization policy appeals to all patriotic dentists and at the present time, in case of war, we could place at the disposal of the Government, the best men in the profession. If you have not joined, do so at once, for you cannot afford to be quiet on this subject.

The private is called to a life of great sacrifice in time of war and the Army Dental Surgeon is needed to help keep these men in shape and look after them when wounded. Our place is to be ready when our Country calls, whether in times of peace or war.—J. W. Beach (Chairman), 131 Allen Street, Buffalo, N. Y.

DENTAL PULP'S SOLILOQUY.

To die or not to die,—that is the question:
Whether it is better to suffer the pangs of whirling stones
And flying disks, or the gnawing torture of enamel cleavers,
And live; but perchance after, unknown to die,
Or to take up arms against this sea of tortures
And with some arsenic end them?
To die,—to sleep; and by a sleep to feel we end
The thousand unnatural shocks that nerves fall heir to.
'Tis a consummation devoutly to be wished,
For who would suffer the pangs of stones and drills,
Were it not a dread of something after death?
The unfilled roots, the apical abscesses must give us pause;
And make us rather bear the ills we have,
Than fly to others we know not of.
For thus doth the X-Ray make cowards of us all,
And thus the former course of pulp destruction
Is sicklied o'er with the pale case of thought.

JOHN STEELE, D. D. S., DENVER.

DENTAL PATENTS.

1141781. Toothpick holder, Charles Dickson, Elizabeth, N. J.
1141788. Casting apparatus, James M. Feerick, Nashville, Tenn.
1142023. Suction apparatus for dental casting apparatus, Edward L. Chott, Chicago, Ill.
1142024. Dental tool, Edward L. Chott, Chicago, Ill.
1142566. Toothbrush, Carl A. Jackson, Kansas City, Mo.
1142443. Latch for drill-heads of handpieces of dental engines, Richard C. Krebs, Chicago, Ill.
1142356. Toothbrush, Charles V. Nellany, New York, N. Y.
1142385. Artificial tooth, Frank T. Van Woert, New York, N. Y.
1142467. Orthodontia appliance, Wm. E. Walker, deceased, New Orleans, La., J. M. Walker, administrator.
47443. Design, Combination knife, fork, spoon, and toothpick, Victor M. Villemain, New York, N. Y.
1142790. Orthodontia appliance, Edward H. Angle, New London, Conn.
1143515. Jaw prop, Wm. F. Dunlop, New York, N. Y.
1142897. Artificial tooth, Albert F. Libbey, Old Orchard, Maine.
1142840. Centrifugal casting machine, Peter J. Pankratz, Stafford, Kan.
1143432. Apparatus for making dental crowns and molar projections, Berthold Proskauer, Berlin, and A. Irrgang, Baumschulenweg, near Berlin, Germany.
1143231. Crown cleaning machine, Edward H. Schaefer, Stapleton, N. Y.
1143443. Instrument table, Adolph W. Schramm, Philadelphia, Pa.
1143927. Combination dental instrument, Willis E. Allen, San Diego, Cal.
1143682. Apparatus for illuminating cavities or surfaces, Robert Biquard, Paris, France.
1143696. Pin for securing artificial teeth and making the same, Karl Finckh, Berlin, Germany.
1144336. Artificial tooth, George H. Whiteley, Jr., York, Pa.
1143677. Blowpipe, Milton E. Winans, Newark, N. J.
47493. Design, Dental mold, Samuel A. Levin, Chicago, Ill.
1144777. Sanitary tooth cleaner, Edwin G. Over, Fort Worth, Texas.
1145368. Crown post, Edmund J. Huff, Jr., Philadelphia, Pa., and F. A. Johnston, St. George, N. Y.
1145246. Blowpipe, Bernard L. Kissell, Joplin, Mo.
1145433. Vulcanizing flask for dentists, Wm. E. Pappert, New York, N. Y.
1146550. Dental molding apparatus, John Burns, New York, N. Y.
1146556. Artificial tooth, Arthur N. Davis, Berlin, Germany.
1146264. Dental splint, Will S. Kelly, Wilkes-Barre, Pa.
1146447. Sanitary toothpick dispenser, Harold W. C. Prommel, Denver, Colo.
1145948. Water-cooled blowpipe, Adolph W. Waern, New York, N. Y.
1147594. Dental tool, Calvin C. Ball, Huntington, W. Va.
1147597. Replacing broken dental facings, John K. Bishop, Roswell, N. Mex.
1147341. Saliva-ejector, Mitridates H. P. Lata, New York, N. Y.
1147580. Dental fulcrum forceps, Joseph F. Turner, Danville, Va.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

COME TO BOSTON.

Gentlemen of the Dental Profession:

On January 20, 1917, you will have an opportunity to give proof of your devotedness to your profession, not merely as individuals, but collectively as a great host. On that evening a banquet is to be held in Boston. At this banquet there will be presented a silver loving cup, the symbol of the affection of the dental profession. This cup will be presented at this banquet to the distinguished gentleman who has given to dentistry the most priceless treasure of its history—to Mr. Thomas Forsyth.

Thomas Forsyth has as yet received no honorary degree. No college or university has in any way shown its appreciation of his contribution to the cause of humanity; and it is better so. For their negligence has given to us, members of the dental profession, the privilege of being the first to publicly honor the man to whom we owe the first and greatest institution of its kind in the world. Each of you is expected, therefore, to do his utmost to swell the numbers over one thousand strong who will gather in Boston on the evening of January 20th, to testify by their presence to the esteem and gratitude which they feel for Thomas Forsyth.

This occasion should be an epoch in our lives—never before in the history of our profession have we been so indebted to anyone—never before, then, has it been so imperative that we acknowledge by our presence, as a professional body, our appreciative indebtedness to this benefactor of humanity.

And wherein is he our benefactor? Thomas Forsyth has given to God's Children an institution which will free them from one of the greatest tortures of childhood. Who has read of his aim to establish a dental clinic for indigent children without a thrill of social pride? The Forsyth Dental Infirmary is no longer an aim, a theory; it is a fact. Hundreds of suffering children are relieved daily from pain, and hundreds of grateful patients are bestowing blessings upon the man who made this possible.

Shall we of the dental profession be less grateful? Shall we who realize the enormous importance of such an institution, who have been begging for it for a generation, shall we fail to give thanks?

Come, then, to Boston, January 20, 1917, and show by your spontaneous response to this general invitation that every man of you, as individuals and members of a great collective body, are proud and glad of the opportunity to honor Mr. Thomas Forsyth of Boston.

BANQUET COMMITTEE ON PUBLICITY,

Frederick A. Keyes, D. M. D., Chairman.
Percy R. Howe, D. M. D.
F. S. Belyea, D. M. D.

OBITUARY.

DR. VAN RENNSLAIR DAVID.

Dr. David was 86 years of age and had practiced dentistry at Sandwich, Illinois, for nearly 50 years, being one of the pioneer practitioners of the state. He had, in recent years, not been in robust health, and was at the time of his death, November 14, 1916, in a sanitarium at Hinsdale, Illinois, where he was receiving special care. Taking his usual morning walk, he attempted to cross the railway tracks and was caught by a train and instantly killed. His sudden taking away was a sad blow to his family and friends, and the Dental Review extends to them its sincerest sympathy.